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COMPUTERWORLD

IBM alters pricing for distributed systems

Option indicates flexibility in licensing policies

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — IBM last week added a software pricing model to its high-end repertoire, which seems to foreshadow increased flexibility in the industry giant's licensing policies. If so, it is a move users applaud.

The new pricing structure applies to two IBM client/server packages, including one introduced last week that turns mainframes into superservers for local-area networks.

The move, moreover, could portend pricing changes across much of IBM's high-end software portfolio.

Exception, not the rule

One IBM insider who requested anonymity confirmed that more pricing announcements are expected within a month but said they will be based on the tiered-pricing model. The client/server pricing structure is one of a small number of exceptions done a little differently, the IBMer said, but is definitely not an indication of where the whole company is going.

Expected within a month is partition-based pricing, which is based on IBM's 6-year-old tiered-pricing structure but gives discounts to customers who have multiple operating systems or whose software packages consume less than 50% of the processor [CW, March 2].

Already, though, IBM has broken ground with the pricing

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DEC seeks server edge via NT

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. and Microsoft Corp. tightened the ties that bind them late last week by finally confirming that Microsoft's Windows New Technology operating system will run on DEC's next-generation Alpha platform.

Widely viewed as a mutually beneficial and inevitable move, the two companies' latest set of collaborative agreements includes an array of plans to integrate the Windows desktop environment with DEC's enterprise-wide networks (see story page 14).

Windows NT is expected to debut later this year and will run on three hardware platforms: Intel Corp., Mips Computer Systems, Inc. and now Alpha.

The notion that applications written for Windows NT will run on these platforms is clearly tantalizing for users with a mix of personal computers, VAXs and other systems.

"I'll think I've died and gone to heaven if they really pull that off," said Ken Krallman, MIS director at Carleton Technologies, Inc., an aerospace manufacturing firm in Orchard Park, N.Y. "One of these days we may get to the point where the underlying CPU won't matter, and the quicker we get there, the better."

Yet while the vendors talked about creating a "high-volume,

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"People with VMS will want VMS on Alpha for their servers. If they want Windows servers, they'll want NT."

David Stone
Vice President
DEC

COMPENSATION INNOVATION

High-tech benefits herald brave new office

BY GARY H. ANTHES
and KIM S. NASH
CW STAFF

The hyper-pay hysteria sweeping the country may have brushed the computer industry, but thanks to moderation in the executive suite, hardware and software firms have for the most part escaped the wrath of stockholders, Congress and the media.

Instead of constructing golden parachutes, many high-tech companies have been dispersing their compensation and benefits dollars more broadly. In some cases, these firms have been embarking on experiments that, experts say, may herald the high-tech workplace of the 21st century — that is, one with a wider menu of what is viewed today as nontraditional benefits and services and a more democratic pay scale.

Most of the human resources experts interviewed conceded that it is not possible to evaluate compensation and benefits programs on a rigorous cost/benefit basis. Indeed, many of those interviewed refused to estimate the monetary cost of implementing or running these programs; however, they insisted that the best programs will pay for themselves by boosting productivity

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Perqy futures

In the 21st century, high tech will likely outpace other fields in providing innovative approaches to salary and benefits packages. For example:

- **A less rigid pay scheme** pegged less to an employee's title and more toward one that considers skills, team performance, product, product performance and other variables.
- **Pushing profit- and equity-sharing** down to lower levels of the firm, often to the very bottom.
- **Doing more** to take into account employees' work environment and life-style needs.

Pilot could give impetus to cellular data traffic

BY ELLIS BOOKER
CW STAFF

SANTA CLARA, Calif. — Nine of the country's largest cellular telephone carriers announced plans last week to test an IBM-developed approach for sending packetized data over their analog cellular networks.

If successful and accepted by users, the approach could open the way for a jump in cellular-based data traffic, analysts said.

If summer trials in San Jose, Calif., go well, the nine group members will offer IBM's CelluPlan II protocol as an open standard to both the cellular industry and equipment manufacturers. The time frame for introducing commercial products is 12 to 18 months, according to IBM.

The group also announced that Chicago-based Sears Technology Service, Inc. is the first large user in the field trials (see story page 16).

There is already a ubiquitous cellular voice infrastructure in place; the announcement would strengthen it by incrementally adding data to it.

For at least one large user, the concept of wireless data has been attractive for years, although the available wireless networks have not.

Last year, New York Life Insurance Co. was unabashedly enthusiastic about wireless data. James S. Ellis, the company's vice president of telecommunications, even coined the term "untethered computing" to help explain what he felt was the significance of such a network.

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12 Attendees at *Business-Week*'s 'Future of World Telecommunications' conference say they are tired of the European PTT monopolies.

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20 San Diego police are on to a credit and calling card scam enacted by thieves who steal card numbers from a credit bureau's computers.

Quotable

> *"Lots of people have been in bed with Microsoft, but they don't last."*
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> *On DEC's new relationship with Microsoft. See story page 1.*

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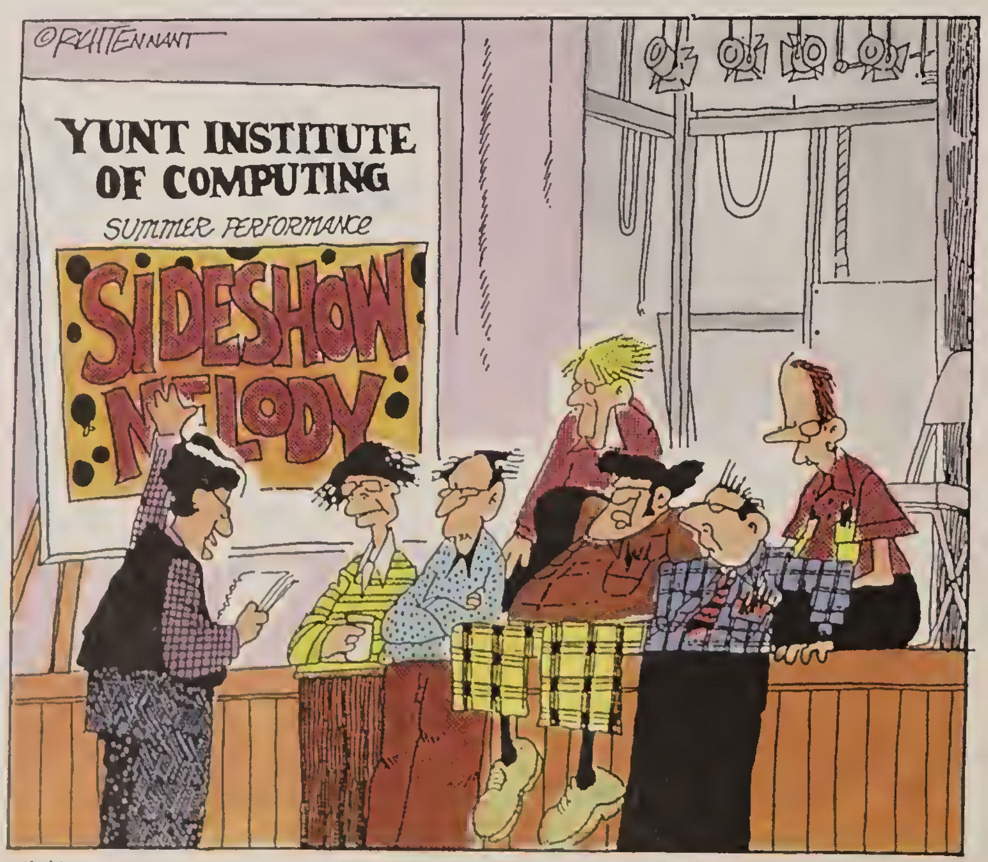


"ALL RIGHT, NOW, WE NEED SOMEONE TO PLAY THE PART OF THE GEEK."

EXECUTIVE BRIEFING

■ **DEC and Microsoft dropped the other shoe last week** and confirmed that Windows NT will indeed run on DEC's next-generation Alpha RISC machines. Allowing for a few bumps in the road as the two hammer out the details, IS managers at sites such as Banker's Trust in New York said they hope these closer vendor ties will bind together all those desktop machines with corporate systems and networks. **Page 1.**

■ ***Computerworld* editorial cartoonist Rich Tennant keeps 'em laughing** as he skewers the industry's high and mighty each week. But Tennant, who also draws The 5th Wave cartoon on this page each week, takes his work very seriously. Cartooning was what got an aimless career on track. **Page 91.**

■ ***BusinessWeek*'s annual worldwide telecommunications conference** offered little hope of truly seamless global communications until the next millenium. Meanwhile, the same carriers that are resisting standardization and open competition on their home fronts were offering to help users patch their multinational networks together — for a price. **Page 12.**

■ **IBM adds a new pricing structure** to its high-end systems software repertoire. Users applauded the move, which could portend other pricing changes across much of IBM's mainframe software. **Page 1.**

■ **After nearly a decade of steady decentralizing,** some U.S. companies are now recentralizing. The goal is to reduce duplicated efforts, establish standards and maximize companywide technology spending. Analysts and IS managers say the shift shows how the path to distributed computing is not a straight one. **Page 85.**

■ **CA's desktop software strategy** is undergoing change. The software giant is counting on new and enhanced applications and a broader base of resellers to build an identity as a leader in the PC market. **Page 31.**

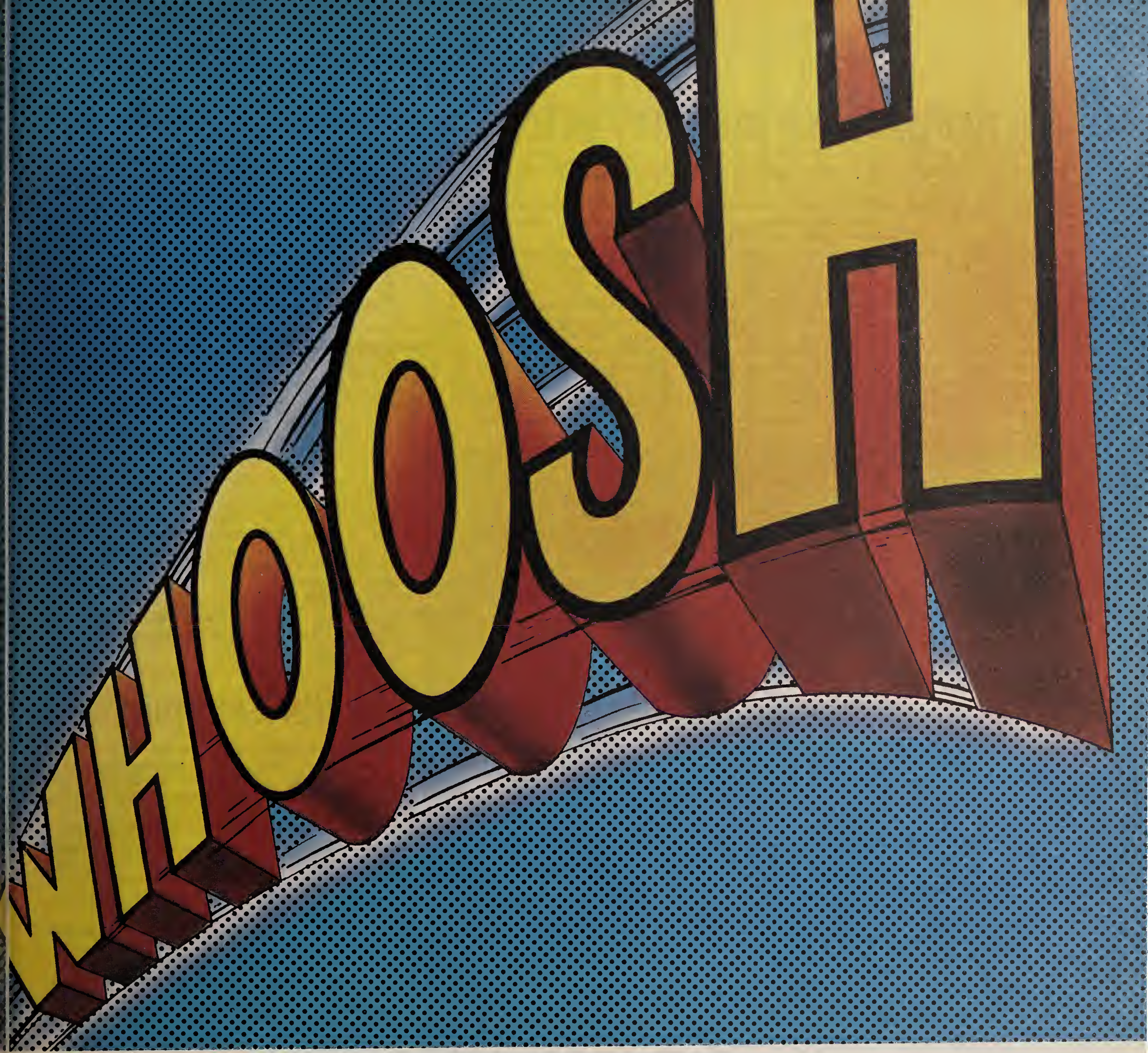
■ **Bank of America is selling its payroll processing service** to Automatic Data Processing for approximately $200 million, in a deal expected to be wrapped up by May. Already a big name in payroll processing, Roseland, N.J.-based ADP ranks as one of the country's largest independent computing services firms, with more than 225,000 clients. **Page 6.**

■ **An earnings drop and a two-month shipment delay** to beta-test sites has slowed the momentum behind Storage Tek's entry into the disk array market. It also caused its stock prices to drop 19% last week. Yet the firm insists it will sell $50 million worth of its Iceberg RAID technology by year's end. **Page 10.**

■ **Caveat emptor may be the phrase du jour in the network management arena.** There is no shortage of hubs, routers and PCs laying claim to support of SNMP, but a recent study shows there is no guarantee that those products actually support the basic requirements of SNMP. **Page 63.**

■ **Lights out, lights dim — call it what you will.** While managers acknowledge that the old goal of a dark, humanless data center is unrealistic, the bottom line is that users want to manage their IS resources from a single location and minimize the human element in data centers. **Page 75.**

■ **On site this week:** Connecticut Mutual Life says it hopes that by the time other companies are taking their first steps in imaging technology, it will be well into more advanced stages of imaging. The insurer is so confident that it is even sharing what it knows about imaging with its rivals. **Page 37.** Waukesha Engine changed its system for producing engine documentation to eliminate the need to switch among a half-dozen desktop publishing packages. **Page 31.**



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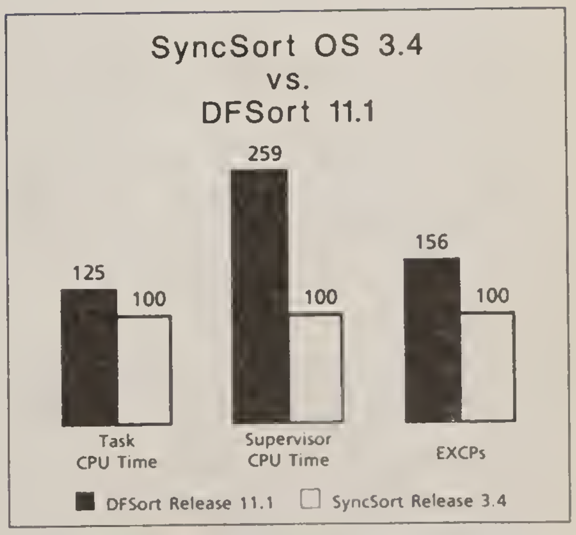

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Intel drops flash memory prices

Despite increased capacity, widespread use is not expected before 1993

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Flash memory — the solid-state, credit card-size brand of memory technology — inched a bit closer to widespread usability last week, as Intel Corp. announced cards featuring higher memory capacity and sharply lower prices. However, analysts said the drop in price will not be enough to spur widespread implementation of the technology, at least before 1993.

Intel's new pricing is significantly lower than existing flash memory. For example, SunDisk Corp.'s 40M-byte Flash subsystem is priced near $2,000, while Intel's 20M-byte flash Series II will sell to systems vendors for $611. (SunDisk said it will cut prices to compete.) Previously, Intel offered no more capacity than 4M bytes.

Intel hopes the low prices will encourage vendors to start designing new products that use flash memory in place of hard or floppy drives and for dynamic random-access memory. Still, flash memory is not going to win instant acceptance.

"Everybody wants to use this type of storage. The problem remains the cost of doing so," said Bill Lempesis, president of Lempesis Research, Inc. in Pleasanton, Calif. Lempesis and others pointed out that many of the target machines, particularly pen-based and "companion" personal computers, are price-sensitive, and expensive media will not help.

"Its near-term impact through most of '92 is not going to be significant," agreed John Biebelhausen, manager of portable systems at Dell Computer Corp., which has acknowledged developing a companion-type PC. He added, however, that flash memory "provides a good alternative for OEM developers to bring new types of functionality into portable computers."

While ideally suited for portables — particularly smaller devices such as palmtop PCs — flash memory will also be used in laser printers, photocopiers, fax machines and other embedded applications, analysts said.

Intel leads the market for these devices, with semiconductor manufacturers such as Toshiba Corp. and Advanced Micro Devices, Inc. also competing.

Despite the pricing concerns, several analysts said, Intel's announcement is important. "I don't see this as a knockout punch for flash memory vs. magnetic disk, but it is a quantum leap for flash memory from where it was," said Crawford DelPrete, a senior analyst at International Data Corp. in Framingham, Mass.

"People tend to ramble on about how inexpensive a hard disk is, but you can't buy just 10M bytes of hard disk," said Nicolas Samaras, director of the semiconductor group at Dataquest, Inc. in San Jose, Calif. He predicts a $1.55 billion market for flash memory by 1995, up from $130 million in 1992.

Flash memory devices are already used in some notebooks, to upgrade RAM and sometimes to upgrade BIOS. Several vendors also use Personal Computer Memory Card International Association (PCMCIA) drives, the standard for using flash memory applications and peripherals. NCR Corp.'s System 3170 weighs in at less than five pounds, in part because it uses a PCMCIA slot in place of a floppy drive.

Dueling densities

Flash and rotating memory will compete for use in the next generation of portable systems

	Flash memory	Hard drive
Cost	• $30/megabyte	• $10/megabyte
Strengths	• Faster access time • Low power consumption • Small size	• Inexpensive • High capacity • Broad system support
Weaknesses	• Still relatively expensive • Lower capacity • Limited systems support	• Larger form factor • Slower access time • High power requirements

CW Chart: Michael Siggins

Beta users still waiting for new Oracle Version 7.0 code

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp.'s Version 7.0 relational database, which was expected to officially debut later this month, may be delayed until June 15, industry analysts said last week.

At the same time, a shipment of Version 7.0 beta-test code to 14 test sites, including Mobil Oil Co., The Boeing Corp., US West and the Hartford Insurance Co., that have been working with alpha code since August, appears to have been pushed back from late this month until May. The beta-test version is expected to repair a problem with the distributed database's global-naming feature.

An Oracle spokesman acknowledged the delays, attributing them to marketing logistics.

Michael Corey, president of the International Oracle Users Group, said he expects the beta-test software to be shipped in May. "It's my impression that what's holding up Version 7.0 is last-minute logistical preparations, not technical factors," said Corey, a Boston software consultant. "I have talked to many people inside and outside the company, and everyone is pleased with the quality of the software."

Oracle Chief Executive Officer Lawrence Ellison told a group of industry analysts in January that Oracle Version 7.0 would be announced in April and delivered by late summer [CW, Feb. 3]. Analysts now believe that the software, slated for Digital Equipment Corp. VAX/VMS machines and some Unix platforms, could come as late as June, with a full-scale rollout of products in the fall.

"Oracle said they would start delivering the developers' copy of Version 7.0 now, so that users would be able to start shipping applications on Version 7.0," said Terrence Quinn, a vice president of research at Kidder, Peabody & Co. in New York who recently visited Oracle's headquarters here. "They are shooting for an October ship date."

Worthwhile wait

The developers version will allow users to build applications that "turn on" Version 7.0 features such as referential integrity, triggers and two-phase commit.

One user said Version 7.0 appeared to be in much better shape than early releases of Version 6.0. Early Version 6.0 code had so many bugs that some users said its quality was less than that of a production release.

Conversely, Version 7.0 "has been worth waiting for," said a US West database administrator at the firm's New Vector Division in Seattle. "They could have come out with it a lot sooner, but they just wanted to expand the capabilities. I think the product's quality is going to be a lot better for it. The first time we hit the button, that baby came up."

Developers irked by OS/2 support

BY CHRISTOPHER LINDQUIST
CW STAFF

While the NT in Microsoft Corp.'s Windows New Technology may still stand for "not there," it appears that IBM is running a couple of steps behind in the race to win praise — and, possibly, support — from developers.

Among the requirements IBM must meet with OS/2 2.0 if it is to reach Microsoft's level of support, according to some developers, are lower tool prices, better communication and more personal treatment.

Several developers said Microsoft has been making an effort to help them move products to NT. This includes sending developers to Redmond, Wash., to work in Microsoft's porting lab with programmers assigned to the NT project.

With IBM, "we felt like we were dealing with a large black box — you sort of hold your breath and hope for a response," said John Kish, vice president for desktop products at Oracle Corp. "When I'm asked, I say I'd much rather deal with Microsoft," he said, adding that Microsoft was very responsive to Oracle's needs to port its database product to NT.

A vice president at a development firm working on both NT and OS/2 products said that getting through the layers of bureaucracy at IBM made developing for OS/2 more difficult than it had to be. "The guys above the [support staff] are dropping the ball," he said.

IBM is working to address the problems, according to Jack McAuley, program manager of software developer support programs at IBM. He said current IBM efforts include removing bureaucracy and making its own tools more price-competitive.

But some consulting firms feel IBM is not doing as much as it could to draw them to the OS/2 camp. "We could be part of Team OS/2 if they'd tell us how to get on the bandwagon," said Wally Nidzieko, owner of Ovation Custom Software in San Diego. He complained that getting development information out of IBM is often difficult.

Complaints about OS/2 from developers stretch back to the days when Microsoft handled the OS/2 developer's kit. When IBM took over responsibility for the developer's kit, Lee Reiswig, assistant general manager of programming for IBM Personal Systems, acknowledged that the company needed to do a better job of reaching out to developers. He promised to release a new, less expensive version of the kit and to provide a family of OS/2 tools.

Plenty to choose from

Tools are and will continue to be available for OS/2 from a variety of sources other than IBM. Symantec Corp. and Borland International, Inc. are among the vendors shipping or planning development tools for OS/2 2.0. And IBM will sponsor an OS/2 2.0 International Tools Conference in San Francisco May 5-7.

The price of IBM's development tools also raises the ire of some developers, particularly smaller ones. "Charging $895 for a developer's kit is not going to make you any friends," one developer said on CompuServe.

In contrast, Microsoft's C/C++ 7.0 and Windows software development kit retail for $499, with a competitive upgrade offer priced at $139.

Larger developers indicated that tool pricing was not a problem, however, as their cost was minimal when compared with the cost of a development effort. "It causes a PR problem, but it's mostly from minor squeaky wheels," said the president of another development firm writing for both NT and OS/2.

While Microsoft's tools, support and promotion efforts for NT generally get high marks, some developers complained that dealings with the company are marred by a "watch your back" phobia.

"I feel as though we have, over time, been led astray by Microsoft," the development firm's president said. He pointed out that Microsoft had initially pushed vendors to create character-mode OS/2 applications, then promptly changed OS/2 Presentation Manager, then deserted OS/2 altogether for NT.

Microsoft is aware of this reputation and is working to counter it. "We are working with software developers at a much earlier stage in the operating system development cycle," said Cameron Myhrvold, director of developer relations in the Systems Software Division.

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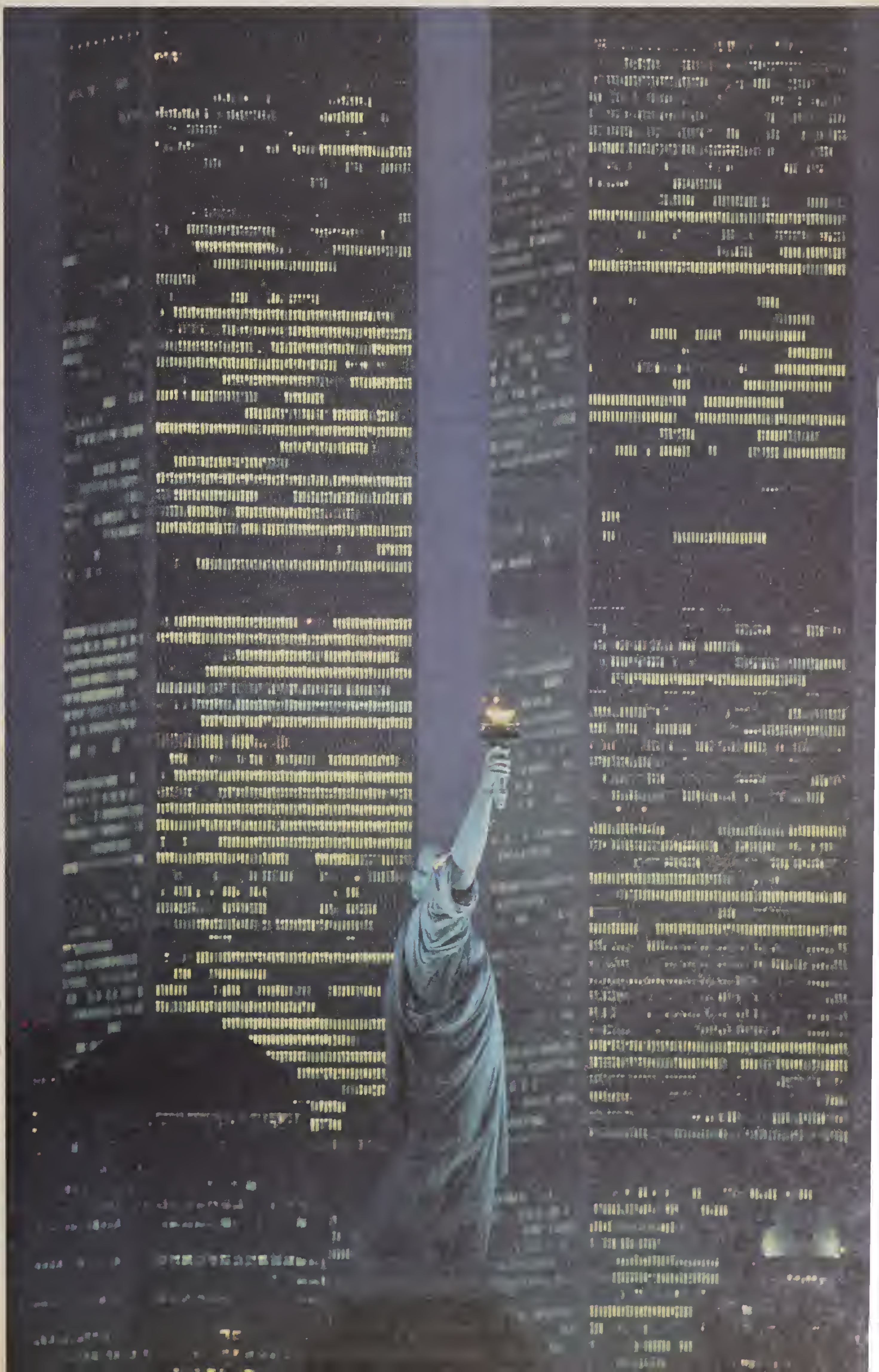

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NEWS SHORTS

PowerBook battery alert issued

Apple Computer, Inc.'s PowerBook portables may be a hotter item than the firm bargained for. Apple officials confirmed that loose battery packs can short out, and if a piece of metal comes into contact with the negative and positive poles at the same time, a sudden discharge of heat can result, which could cause a fire. Only two cases have been reported, but Apple is notifying all owners and offering users who call (800) 377-4127 a free protective case for the batteries. Meanwhile, Apple advises keeping battery packs in plastic sandwich bags.

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FCC caves in to Tariff 12 users

The Federal Communications Commission reversed an earlier decision and said customers with Tariff 12 contracts that include 800 services may alter their service agreements with AT&T. Last August, the FCC ruled that those deals could not be modified until technology advances allowed customers to keep their 800 numbers when changing carriers. Customers complained that the restriction caused undue hardship.

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Back to the drawing board

Investigators in Hong Kong, Taiwan and China last week cracked a sophisticated software ring that deftly re-created Microsoft Corp.'s MS-DOS and Windows hologram symbol, a supposedly foolproof security measure. An estimated 450,000 to 3 million counterfeit copies of the hologram were copied in China and smuggled into Hong Kong. The ring is suspected of shipping up to 75,000 pirated copies of MS-DOS and Windows. Litigation will be brought against one Taiwanese suspect and the Shenzhen Reflective Materials Institute, an affiliate of Shenzhen University.

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New York state ISDN trial ends

The 2-year-old state of New York Integrated Services Digital Network (ISDN) trial came to an official end last week. Participants submitted their final report, saying they have worked out many of the issues by creating a statewide infrastructure for multimedia ISDN-based services. Participants included local- and long-distance carriers and central office equipment vendors.

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Hyundai bucks manufacturing trend

Hyundai Business Group of Korea announced last week that it will move worldwide business management, marketing, product development and manufacturing for its information systems division from Seoul to the U.S. Global responsibility for Hyundai's full line of personal computers will come under the jurisdiction of U.S. management and will be headed by Edward D. Thomas, who was named president and chief operating officer of the division.

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Short takes

Oracle Corp. last week hired Jnan Dash, who was manager of strategy and technology for IBM's Enterprise Database Solutions Group, as vice president of database technologies. Dash worked at IBM for 16 years and was involved in developing products such as DB2 and OS/2 Database Manager. . . . **Computer Network Technology Corp.** last week announced an unlimited-distance connection between IBM mainframe channels and high-speed direct-access storage devices. It does not require special host software. . . . **Intel Corp.** has expanded its LANSight Support product to remotely monitor desktop computers that are part of **Microsoft** LAN Manager and **IBM** LAN Server networks. The new version, 3.0, is now shipping and costs $395. . . . **Zeos International Ltd.** financials for last quarter were due last week but were delayed until May 11 by a glitch in the company's newly installed management information system. . . . **Artisoft, Inc.** said it plans to acquire **Performance Technology, Inc.**, making it a wholly owned subsidiary. The deal requires approval by both companies' boards of directors. . . . **Picturetel UK Ltd.** has received a $1.2 million order for videoconferencing systems from **Nuclear Electric PLC** — the biggest such contract ever.

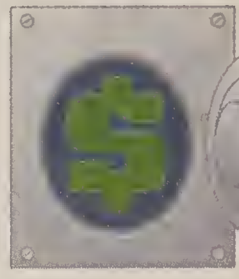
More news shorts on page 16

Bank exits payroll processing

BankAmerica expects to reap $200 million in sale of DP unit to ADP

BY JAMES DALY
CW STAFF

SAN FRANCISCO — BankAmerica Corp. has agreed to sell its payroll processing service to Automatic Data Processing, Inc. (ADP) for approximately $200 million, bank officials said last week. The sale of the Business Services Division is expected to be completed by mid-May.



The division provides financial processing, accounting and other data processing services for about 17,000 clients and has an annual revenue of more than $125 million.

Bank of America officials said the bank will continue to maintain its own internal information services at locations throughout the West.

Roseland, N.J.-based ADP, with $1.7 billion in revenue and more than 225,000 clients, is one of the country's largest independent computing services firms and is already well-known for its payroll processing.

Like a glove

An ADP spokesman said the purchase of the Business Services Division was a natural fit. "The division provides a function very similar to a core business and will give us a client base that expects the same service we now provide," said Ed Kanarkowski, vice president of corporate communications.

Logistically, Kanarkowski said, it is still too early to say if any changes will be made among the division's 1,700 employees or the unit's extensive technological setup. "We're evaluating everything, but nothing has been set in stone yet," he said.

In recent years, Bank of America has consistently moved to focus more intently on banking. "While payroll processing has been a successful fee-producing business for us, we do not consider it to be a core banking service," Richard Griffith, executive vice president at Bank of America's World Banking Group, said last February, when the bank declared its intent to sell the unit.

Company spokesman Peter Magnani said payroll processing is a very technologically intensive business and that the firm decided those resources could be better allocated elsewhere.

ADP also recently completed two acquisitions: Independent Election Corporation of America in Lake Success, N.Y., which distributes proxies and other data to securities owners; and Autonom Computer Beteiligungs GmbH in Germany, which provides automotive dealer services and systems.

Magnani said Bank of America expects the sale to result in an after-tax gain of about $90 million in the second quarter.

ATM expansion

Bank of America also announced last week that is has purchased 1,523 automated teller machines (ATM) from Diebold, Inc. as part of an effort to expand and update its ATM network in the wake of its merger with Security Pacific Corp.

The union creates America's second largest bank, with about $200 billion in assets, $150 billion in deposits and hundreds of branches in 10 states. Only Citicorp, with $217 billion in assets, is larger.

The ATM purchase gives Bank of America more than 4,500 teller machines, making it the largest proprietary ATM network in the U.S. Six hundred of the Diebold Interbold I series units were purchased in late 1991, and the remaining 923 were bought in recent weeks, Bank of America officials said.

A portion of the machines are through-the-wall walk-up units, while the remaining units are a mix of drive-up and walk-up machines.

Interbold is a joint venture between North Canton, Ohio-based Diebold and IBM.

JAMES DALY

CSC cinches $64M deal with large steel company

BY CLINTON WILDER
CW STAFF

EL SEGUNDO, Calif. — Computer Sciences Corp. (CSC) last week disclosed a 10-year, $64 million outsourcing contract with WCI Steel, Inc., its first since locking up a $3 billion contract with General Dynamics Corp. last year.

WCI, a Warren, Ohio-based steelmaker with $500 million in annual sales, will turn over its entire information systems function to CSC, including applications development and maintenance. All 51 of WCI's IS employees, including director of information services Harry Shoger, will become CSC employees. The contract takes effect Friday.

Technically, the contract was won and will be managed by Compusource, a small Cary, N.C.-based outsourcing services vendor acquired by CSC last summer. Compusource will take over the leases on WCI's IBM 3090 Model 200E and peripherals and will attempt to leverage that CPU capacity to sign up other Midwestern outsourcing clients running MVS, said Pete Boykin, president of the CSC division that includes Compusource.

Hitting it big

The deal is the largest ever for Compusource, which has some 70 outsourcing customers. It is only the second in which Compusource has taken over the client's computers. The first was a 1980s deal with Reactive Metals, Inc. in neighboring Niles, Ohio. That deal was recently extended from 10 to 13 years, Boykin said.

CSC has been busy taking over General Dynamics' huge operation and should not be expected to win other major deals in the near term, said Stephen McClellan, vice president of securities research at Merrill Lynch & Co. "They have to concentrate on digesting and executing that one," he said. "I don't expect much of any consequence for another six months."

CSC boosted its commercial megadeal sales efforts last month by rehiring Robert W. Forsyth, a veteran CSC marketing executive who had spent the last five years as president of Synercom Technology in Houston. Forsyth was named president of the marketing division of CSC's Industry Services Group.

Largest worldwide RDBMS market share: 30% -Gartner Group

Fastest benchmark ever: 1,073 tpsB -Codd & Date

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HP to add Unix management, DME support

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week extended its OpenView network management platform to include performance and capacity management for Unix systems with support for popular non-Unix local-area networks and host environments to come.

HP is expected next week to separately announce a new version of OpenView that will incorporate support for the Open Software Foundation's Distributed Management Environment (DME), including the Common Management Application Programming Interface that allows third-party applications to be ported to DME-compliant platforms.

HP's new Unix management software, PerfView, will support DME as soon as OpenView does, HP spokesman Wayne Morris said.

HP's PerfView is said to provide network managers with a graphics-based, on-line, centralized view of performance and use trends on distributed networked systems. It consists of agents that sit on each network node and collect information — such as CPU, disk and memory use levels — and feed key data up to a central server. The agents use "management by exception," which screens out irrelevant data and reports when use exceeds a predefined threshold or performance drops below a specified level, Morris said.

PerfView will initially manage HP Apollo 9000 workstations, HP 9000 servers, HP 3000 business systems and Sun Microsystems, Inc. SPARCstations. However, HP plans to extend management support to IBM AIX, Digital Equipment Corp. Ultrix, OSF/1 and Novell, Inc. NetWare platforms in the future, Morris said. And the vendor will work with third parties such as Computer Associates International, Inc. and Legent Corp. to provide management of IBM and DEC hosts, he added.

The ability to centrally manage a broad range of Unix and non-Unix systems could differentiate PerfView from existing products, which tend to be tied to a specific type of server platform, said Barbara Sannerud, director of management consulting at Gartner Group, Inc.

However, user demand for centralized, multivendor Unix systems management will not mature until Unix reaches beyond engineering and scientific environments to the corporate data center, Sannerud said.

NASA Langley Research Center in Hampton, Va., for example, sees little use for fault and capacity management products for its Unix systems, said Robert Grandle, a system manager at the center. "When you're running a business application, if you run out of disk, your accounts receivable comes to a halt," he said.

However, with a research group such as NASA's, "if a disk is full, we beat users over the head to get rid of some files if they want to go on working," Grandle said.

HP is likely to find a ready market among companies that want to manage corporate systems that are distributed across mainframes and Unix platforms, Sannerud said. One such company, San Francisco-based Charles Schwab & Co., has already started working with HP to create a centralized network management platform based on OpenView [CW, April 20].

The first release of PerfView will run on HP 9000 systems under HP/UX and OSF/Motif. Availability is slated for July. The central analysis software is priced at $26,000, including a copy of HP OpenView Network Node Manager.

IBM ships 16M bit/sec. unshielded copper wire hubs

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — Officially blessing high-speed Token Ring networking on unshielded copper wires, IBM said last week it is shipping the product embodiment of the technology it announced last November with hub maker Synoptics Communications, Inc.

The jointly developed technology — which reclocks transmission signals at every port in a 16M bit/sec. Token Ring network to avoid signal distortion — is expected to be incorporated into the emerging standard for these Token Ring speeds on unshielded wire. The reason is that it has been sanctioned by 80% Token Ring market share giant IBM, analysts said.

How to do it

Unshielded 16M bit/sec networking from IBM requires the following:

- IBM's 8230 Controlled Access Unit wiring hub.
- Filters added to the 8230 (available now) for Category 4 and 5 high-grade copper.
- New 8230 Model 2 (to ship in June) for Category 3 medium-grade copper.

Filters for IBM's existing 8230 Controlled Access Unit — a Token Ring wiring hub — attach to each active port in the hub and work in conjunction with IBM's adapter cards to sift out electromagnetic interference. They have not yet been tested for use with other vendors' cards, IBM said.

A new 8230 model is required for lower grade copper (Type 3) and is slated to ship in June.

IBM explained that the products are Token Ring's answer to 10Base-T, a standard that kicked in mid-1990 to run Ethernet over unshielded copper wire and reignited that market. Jane Celly, IBM's manager of local-area network systems marketing, indicated that, because of 10Base-T's acceptance, the proliferation of inexpensive and easily installed unshielded wire has rendered the medium attractive to companies that also want to run high-speed Token Rings on that cabling.

However, given that most of IBM's installed base has opted to run IBM's long-recommended Shielded Twisted Pair Type 2 cabling plant, "unshielded twisted pair is not something we're looking into right now," said Steve Skinner, network systems specialist at Blue Cross/Blue Shield of Kansas in Topeka.

The insurance firm is installing Type 2 throughout its company and runs no 10Base-T, Skinner said, but it does plan to run 16M bit/sec. Token Rings companywide.

Even though Loral Aerospace Corp. in Newport Beach, Calif., is using predominantly unshielded wire, "We're not even pushing our 4M bit/sec. Token Rings yet," said Bill Conley, manager of information system services. "Until we get into heavier client/server networking, I suspect that the incentive to spend the money to upgrade our hubs will not be there."

However, while the demand for 16M bit/sec. networking "isn't rampant," it could become so with new applications like imaging," said Frank Dzubeck, president of Communciations Network Architects, Inc., a consultancy in Washington, D.C. He predicted that users will not leapfrog the technology for higher speed LANs "for a couple of years."

Synoptics implemented its version of the technology as a $2,095 host module for its Lattisnet System 3000 intelligent wiring concentrator. The module started shipping in January. Synoptics said its Token Ring sales increased by 5% in the subsequent quarter.

Router, hub vendors ink accords

BY JOANIE M. WEXLER
CW STAFF

BEDFORD, Mass. — Router maker Wellfleet Communications, Inc. significantly broadened customer access to its products last week via reseller and technology-swap agreements with three key smart hub vendors.

Intent on grabbing market share in the fertile internetworking market, the vendor beefed up its distribution channel via nonexclusive relationships with Cabletron Systems, Inc., Ungermann-Bass, Inc. and Fibermux Corp. All three vendors have signed on to bundle Wellfleet products with sales of their own equipment. UB and Fibermux will also work with the vendor to develop Wellfleet-based technology for their hubs.

Routers allow individual local-area networks to intercommunicate, and smart hubs are network service "distribution centers" that provide structured cabling, network management, internetworking and other functions.

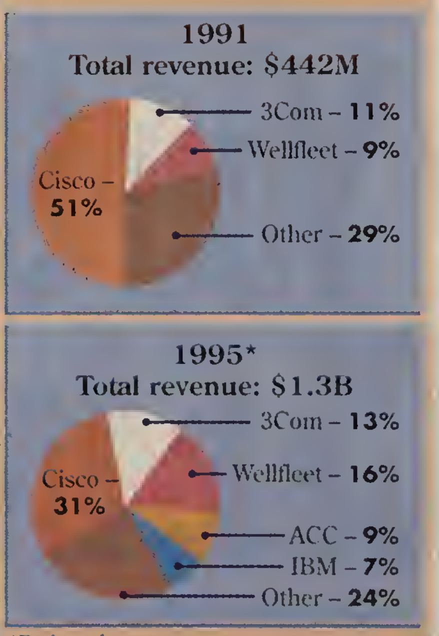
The Wellfleet deals — which follow in the rampant vendor-partnering footsteps of primary router rival Cisco Systems, Inc. last year — are intended to open up channels for customers seeking one-stop network shopping, said Gary Bowen, Wellfleet's senior vice president of marketing, sales and customer support.

Such user tendencies are illustrated by Consolidated Rail Corp. in Philadelphia. The firm recently chose Cabletron as a hub supplier and network integrator, in part because of its ability to supply Wellfleet routers and because Wellfleet is also a partner in Cabletron's Spectrum network management program, said Bill Everett, manager of telecommunications planning at Consolidated Rail.

Roaring routers

Wellfleet's projected share of the multiprotocol router market will nearly double by 1995

Percent of worldwide market share by revenue



*Projected

Source: The Yankee Group

"One of our primary criteria was that the vendor be able to provide all the products we wanted," Everett said.

Analysts said they see Wellfleet's moves as "important in the sense that if customers want Wellfleet products through these vendors, they can get them," said F. Mark D'Annolfo, a vice president with Adams, Harkness & Hill, Inc. in Boston. "It's hard to say a few years down the road what the preferred channel distribution will be: Wellfleet is leaving its options open."

In addition to reselling stand-alone Wellfleet routers, UB will work with the company to develop network management applications for Wellfleet routers under UB's NetDirector management system. UB and Wellfleet will also develop interoperability between Wellfleet gear and UB hub router modules supplied by Advanced Computer Communications, Inc.

Wellfleet and Fibermux will jointly develop router cards for Fibermux hubs. Wellfleet has a similar existing agreement with hub maker Bytex Corp.

Cabletron said it has no plans to develop a Wellfleet router module, but there is nothing in the deal or in its existing agreement with Cisco to preclude a future move.

"We don't want to lose a potential sale because a customer only wants the Wellfleet box and not the Cisco box," said Michael Welts, Cabletron's vice president of marketing. "Through Spectrum [sales], we have come across a number of sites with Wellfleet routers in addition to or instead of Cisco."

None of last week's agreements cover resale of Wellfleet's pending high-end Backbone Node router.

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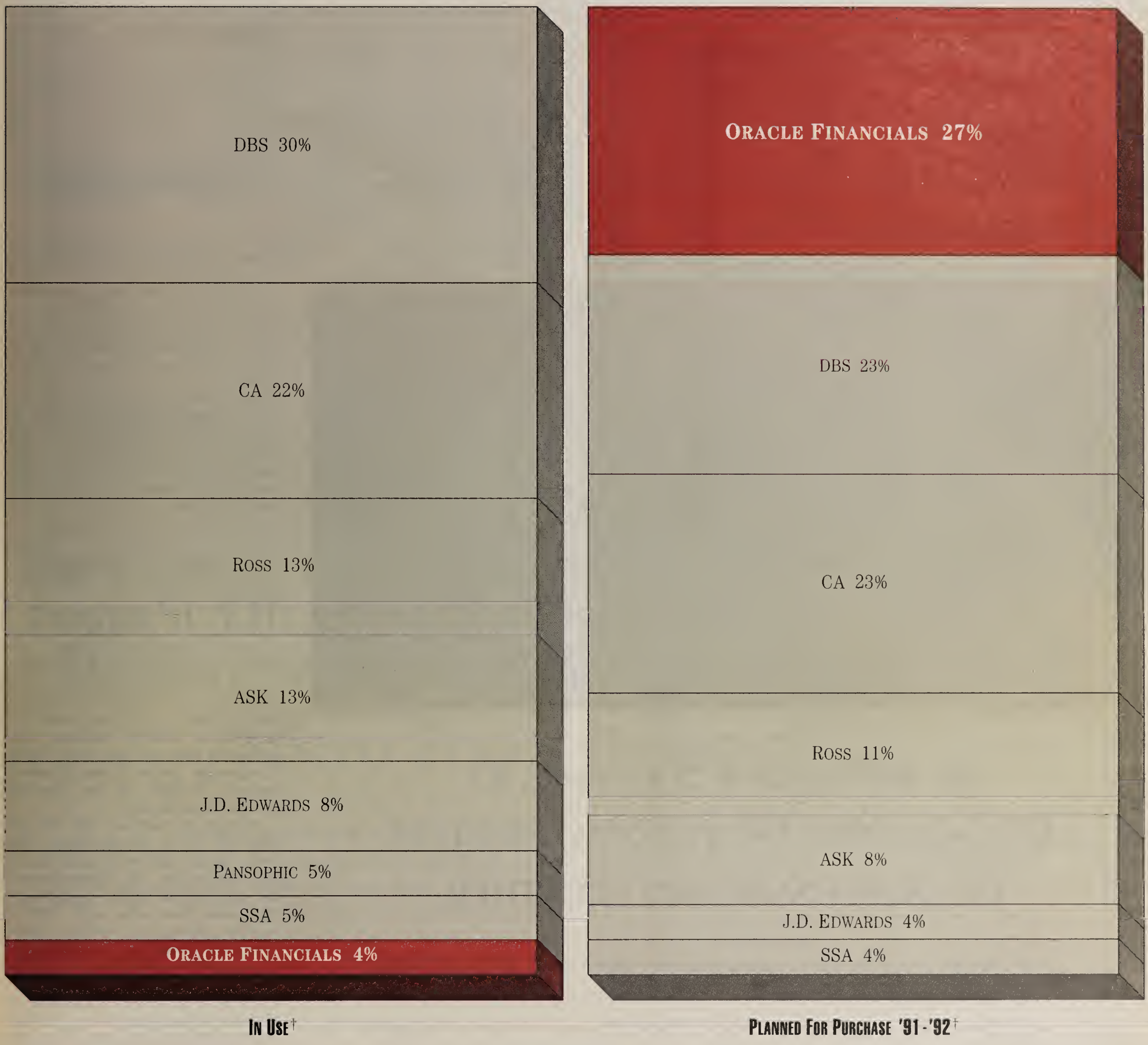

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Storage Tek losing steam in disk array market

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Colo. — The momentum behind Storage Technology Corp.'s entry into the disk array market slowed considerably last week following news of lower-than-expected earnings and a two-month shipment delay to beta-test sites. The combination of events triggered a 19% drop in the company's stock price last Tuesday.

The firm said it still expects to sell $50 million worth of its Iceberg redundant arrays of inexpensive disk technology by year's end. That is one-third of a $150 million order backlog, company spokesman David Reid said.

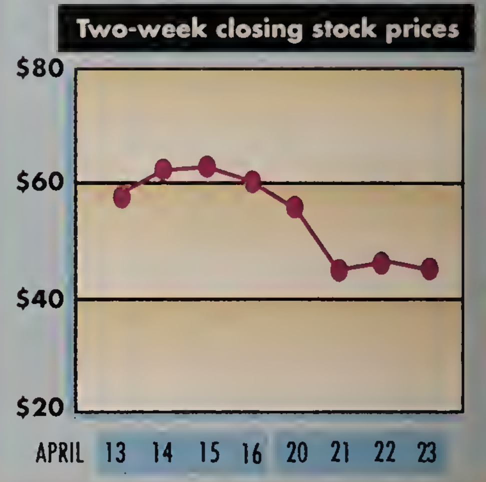
Storage Tek claimed it was sticking to its original plan of beta testing Iceberg units in the first half of the year, even though the testing is being done in-house. "We consider our internal testing to be a genuine beta test," Reid said. "It's up and running. We expect to ship external beta-test versions in the third quarter."

Some users did not appear to be worried about the date of eventual Iceberg shipments, however. "I said I would take a sit-back-and-wait approach to Iceberg, and I'm glad I did," said one Midwest user of Storage Tek's automated tape library. "We didn't want to worry about jumping in too early and dealing with the early problems."

Wall Street, however, is not as patient. Shares of Storage Tek stock have been trading down for the last couple of weeks, based on rumors of slowing sales. The stock rebounded a bit after Storage Tek decided to repurchase 1 million shares (see chart).

Sliiiiding

Storage Tek's stock has plummeted as investors turn cool on the company's near-term prospects



CW Chart: Janell Genovese

Storage Tek's first-quarter results may have contributed to Wall Street's negative take on the company's stock. The peripherals manufacturer reported net income of $12.5 million for the period, compared with $13.4 million for the comparable period last year. First-quarter revenue was $333.7 million, off 8% from the first quarter of 1991.

John Dean, a senior analyst at Salomon Brothers, Inc.'s San Francisco office, said many of his peers had predicted quarterly earnings of 50 cents per share and were surprised by 30-cent earnings for the first quarter.

Other factors contributing to the stock's precipitous decline were tape library sales that fell below analysts' expectations, a revenue shortfall at recently acquired XL/Datacomp, Inc. and rumors that IBM would deliver its own automated tape library soon.

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NetWare to gain TCP/IP support

BY JOANIE M. WEXLER
CW STAFF

PROVO, Utah — Novell, Inc. will further integrate its NetWare local-area networks with Unix next year when it adds Transmission Control Protocol/Internet Protocol (TCP/IP) to its non-Unix NetWare client software.

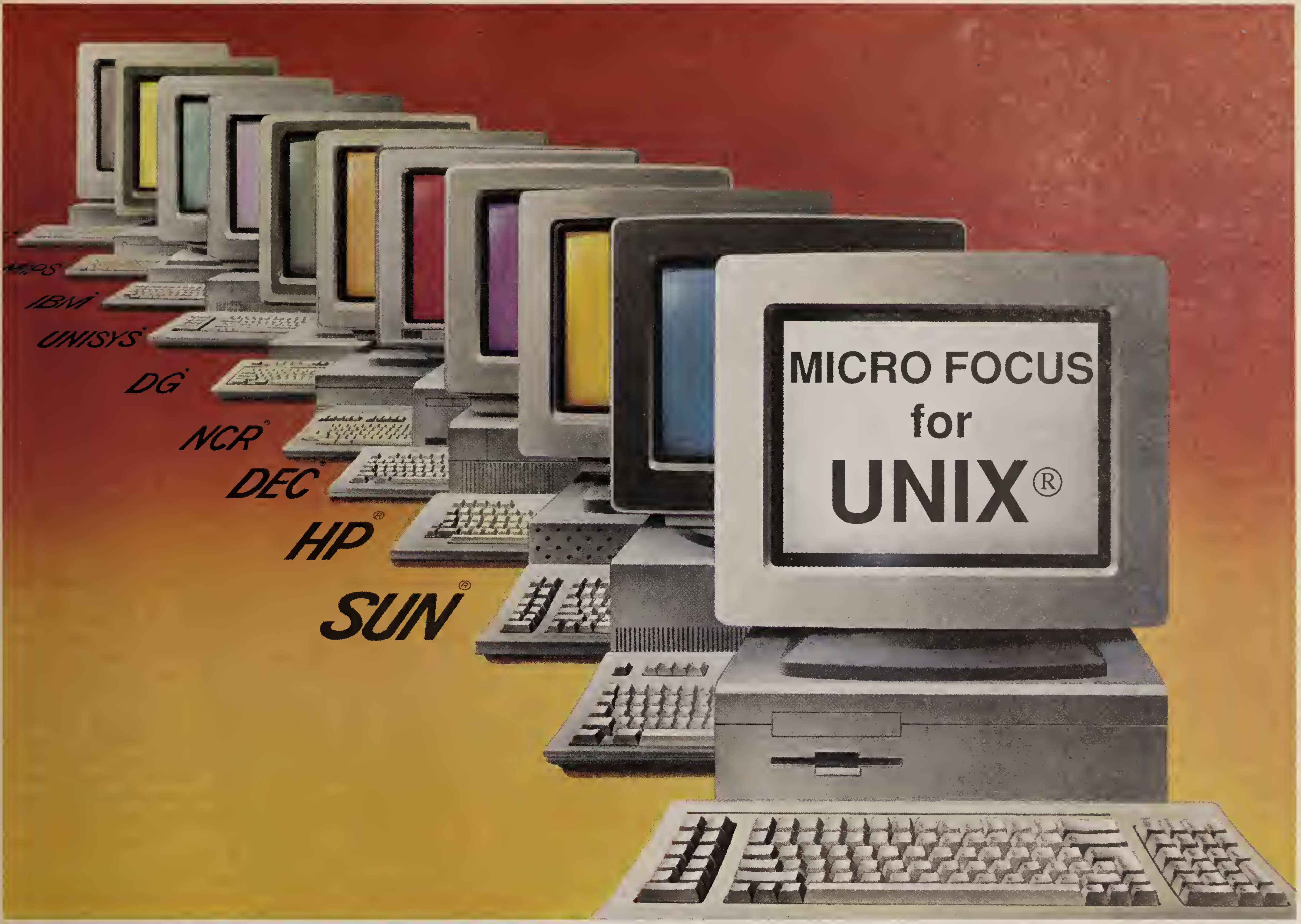
Alhough the company has not yet made any formal announcements, Bob Davis, Novell's director of marketing for Unix connectivity, told *Computerworld* last week that the vendor intends to accommodate users who prefer TCP/IP transport protocols to NetWare's inherent SPX/IPX stack but would like to retain other NetWare services.

"If a customer doesn't want IPX anywhere but would like other components of NetWare, such as any of our NetWare Loadable Modules, communications services or access to [Systems Network Architecture], further integrating the two environments will let users choose the components of each they like the best," Davis explained.

Novell's most current NetWare version, 3.11, supports TCP/IP on the server only for Unix client access.

Davis said that "one of the top three concerns of our major accounts today is integrating Unix and NetWare."

For example, mixed NetWare/Unix shop Merrill Lynch & Co. can "almost guarantee an explosion in Unix," said Vincent Curatolo, vice president of distributed systems. He said NetWare client TCP/IP would be "very, very attractive," and that ideally, he would like to run just the one protocol corporatewide.



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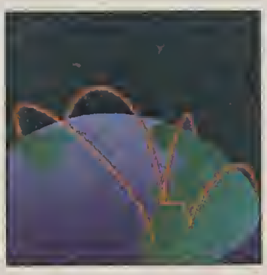
Global telecom users seek one-stop shop

BY ELISABETH HORWITT
CW STAFF

NEW YORK — "The world isn't open yet. [Instead,] there is disharmony, invisible barriers and administrative restrictions — how can we create a truly open market?"



That is the question one attendee put to a panel of regulators and vendors at last week's *BusinessWeek*-sponsored "Future of World Telecommunications." Attendees said they were tired of waiting for regulatory bodies such as the European Commission (EC) to force Postal Telephone and Telegraph authorities to abandon their proprietary, monopolistic practices. This dilemma is driving some users — albeit slowly and often reluctantly — into the arms of global systems integrators, according to a recent Deloitte & Touche management consulting survey presented at the conference.

Corporate communications managers surveyed by the consultancy's Washington, D.C., practice said they would hire any carrier, regardless of nationality, that could provide one-stop shopping, centralized billing and bandwidth on demand in a cost-efficient manner.

But the survey found that many multinational corporations are reluctant to entrust their global networks to a single provider.

"Network outsourcing is going up as users' comfort level with carrier [reliability] goes up, but it is only just beginning overseas," explained Joseph Kraemer, a partner at the Deloitte & Touche unit. "Many users are still keeping their network control centers," he said.

Many users would prefer to have their needs met by an alliance of carriers that provide single-point billing and service.

However, carriers need to comply with standards before users can mix and match their services, and regulatory bodies such as the EC need to push more before this happens, according to Donald Liao, a network manager at Metropolitan Life Insurance Co.

Standardization would not only make "talking in a global, seamless village possible" but also allow companies to make multinational network choices now, without fear of future obsolescence, Liao said. "There is always the fear from the end user that there will be no bridge at the end of the road."

Other users still hope to find one integrator to take over the burden of implementing, managing and maintaining their networks. "I'm going to the global outsourcing workshop to learn what I am facing and who to go to for help to establish global communications," said Buddy Stinson, director of information systems and telecommunications at Sara Lee Knit Products in Winston-Salem, N.C. "It's hard to crack those international data networks alone."

Eager to help are firms such as British Telecommunications PLC, France Telecom and AT&T, which have looked to the global network outsourcing arena with increasing interest as deregulation has threatened their dominance of home markets.

American Cyanamid Co. put its European network needs in the hands of France Telecom more than a year ago, according to the pharmaceutical firm's manager for network planning, Joseph Kascik. As a result, American Cyanamid is largely unconcerned about the status of EC initiatives — except that it would like to be able to resell some of its overseas bandwidth to other companies, Kascik said.

No global village, yet

How far have we gotten toward a truly open global environment? The following makes it clear, according to the EC:

Accomplished: Telecommunications equipment approved for sale in one EC nation is now automatically approved by other members.
Still pending: Standardized network service interfaces to customer equipment. Right now, equipment that works with one country's network may not work with another's.

Accomplished: Initiative to ensure a consistent rate structure for network services across Europe.
Still pending: Consistent intranational and international call rates. A four-minute call across the French border still costs nearly twice as much as an equivalent call within France.

Accomplished: The opening up of national packet-switched and value-added network markets to outside competition.
Still pending: The same for leased-line and switched-voice markets, which remain Postal Telephone and Telegraph monopolies in most countries.

IBM alters pricing for distributed systems

CONTINUED FROM PAGE 1

model announced last week. Traditionally, pricing for the host portion of a client/server duo has been based on the mainframe tiered model, with a separate charge for the LAN portion. Now, however, the price is based on the number of LANs directly connected to the mainframe; there is no additional charge for the host software.

For users of the two packages involved, the new pricing saves up to $5,000 each month in license fees or up to $235,000 in a onetime charge, depending on processor size.

In addition, IBM promised a software administration package by April 1993 that will help users count the number of LANs connected to a host in order to keep track of software expenses. This package will be "passive," IBM managers said, and will not prevent software use or cut customers off for any reason.

Carl Wohlers, an IBM marketing support administrator in Atlanta, said he was not committing the entire company to the new pricing and software administration scheme. "I only know about my piece of the organization," Wohlers said.

Better late than never

Nevertheless, users reacted positively to the idea. "It's about time," said Bill Wilkins, president of John Alden Systems Co., the insurance company's information systems subsidiary in Miami. "I agree completely with the new approach."

David Moore, vice president at Mellon Bank Corp. in Pittsburgh, concurred: "IBM is getting real intelligent about pricing. They want to play on both ends of the stick — to connect LANs to the motherhouse and to continue to drive demand for mainframes."

Wohlers said the new pricing model was created because "customers were wondering how they could justify the first implementation step or implementation by just one department. The pricing structure we had just didn't fit that."

Under the new pricing plan, users pay for each LAN attached directly to the mainframe. The per-LAN onetime charge is $12,000, and the per-LAN monthly license fee is $250. In comparison, under the traditional tiered-pricing scheme, monthly license fees ranged from $145 to $5,150, and onetime charges ranged from $7,100 to $247,000, depending on the size of the mainframe.

The software administration package and client/server pricing model apply, at least for now, to only two software products from Enterprise Systems. The first package, LANres, was announced last September with prices based on the tiered scheme, but those prices have now been changed, Wohlers said. LANres, scheduled to be shipped Friday, turns the System/390 family of mainframes into disk and printer servers for Novell, Inc. NetWare LANs.

The second package is similar to LANres and turns the System/390 into a super-file server for LANs that can include a mix of OS/2, DOS and Unix workstations. The package, Workstation LAN File Services (WLFS), will also ship Friday, Wohlers said.

The new software runs partly on an OS/2 server and on a mainframe under VM. Wohlers said IBM "recognizes the need" for an MVS version of WLFS, but he would not commit to a date for when that would be ready.

St. Elizabeth Community Health Center in Lincoln, Neb., was a beta-test site for LANres and has been using it since August 1991, said Jeff Bredthauer, a senior network programmer/analyst. "The pricing change was very smart on IBM's part," he said. "They were looking at it from the wrong perspective — from the mainframe view. It is really a PC networking product," Bredthauer added.

BT North America puts frame relay on fast track

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — BT North America, Inc. put the pedal to the metal last week when it accelerated its worldwide frame-relay plans by about two years with higher speeds and broader global reach.

The company has upped its frame-relay service access and trunk speeds from 56K bit/sec. to T1 by blending the StrataCom, Inc. InterPacket Exchange (IPX) fast-packet switch with its own Turbo Engine switching platform in its network. The launch is set for the fourth quarter.

The move is part of a general expansion of the carrier's Global Network Services from 24 countries to 62, half of which will be added during the next year and the others by the end of 1994.

The decision came in time to placate The Frank Russell Co., a brokerage firm and BT customer based in Tacoma, Wash., that will begin installing local-area networks at its headquarters and worldwide offices in London, Tokyo, Toronto and Sydney, Australia, this summer.

"We don't see our relationship changing with BT, but it might have if BT hadn't come through," explained Bill Branson, senior network technical analyst at Frank Russell. "We're going to need those higher access speeds [for LAN interconnection] within eight months."

The Turbo switch has limited BT's ExpressLane frame-relay service to 56K bit/sec. speeds.

Despite unresolved issues surrounding frame relay, such as congestion control, "I think the backlog of demand is significant," said Berge Ayvazian, vice president of communications research at Boston-based consultancy The Yankee Group. He said AT&T has a queue of would-be customers awaiting its services, which are due to be launched midyear.

Yankee Group anticipates the market for public frame-relay services will near $1 billion by 1995.

StrataCom's IPX — the foundation of AT&T's and several other carriers' frame-relay networks — allows the higher speeds to run alongside the features afforded by the BT-designed Turbo switch. Those features include switched virtual circuits for on-demand networking and X.25-to-frame-relay gateways, "which will allow everyone to communicate, since we won't be bringing all our LANs up at once," Branson said.

The move positions the carrier as a candidate for market share leadership, according to Rick Malone, a principal at Dedham, Mass.-based consultancy Vertical Systems Group. A major reason is that BT "has a solid field infrastructure that understands frame relay," Malone said.

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BY MARYFRAN JOHNSON
CW STAFF

DECWORLD '92

BOSTON — As DECworld '92 opens here today, Digital Equipment Corp. finds itself confronted with the task of convincing thousands of nervous customers that the route from VAX to Alpha is not as rocky as it looks.

With VAX sales stalled in the wake of DEC's own hoopla about its next-generation Alpha reduced instruction set computing (RISC) chip, the Maynard, Mass.-based vendor needs to spell out its strategy for bridging current and future VAXs over to Alpha-class machines, analysts and users agreed. This may be one reason why DEC announced plans last week to shift its engineering orientation for a new marketing focus (see story at right).

Some customers have already seen evidence of DEC's aggressive transition plans to the new architecture. "We are getting a new MicroVAX, and they've promised us that any machine we buy now can move up to Alpha," said Mohammed Mosaad, senior vice president of information systems and telecommunications at Prudential Securities, Inc. in New York.

Among the hardware on display at DECworld will be the so-called Laser machine, a board-upgradable Alpha transition box in the VAX 6000 class. Also slated for a DECworld debut is DEC's future mainframe system — code-named Blazer — that incorporates the CMOS technology pioneered in high-end VAX 6000s, according to sources familiar with DEC's plans.

For Ken Krallman, MIS director at Carleton Technologies, Inc. in Orchard Park, N.Y., the trip to DECworld will be a chance to see and touch the Alpha technology. "I want to get that nice warm feeling of seeing the thing work," he said. "This may be the worst thing DEC can hear, but I'm in a situation where I could really use a new CPU, but there's no way I'll buy a new VAX if the thing is scrap iron in two years."

One certainty is that DEC cannot afford any delays, noted Kevin Oberman, network manager of the engineering division at the University of California Lawrence Livermore National Laboratory in Livermore, Calif. "Thus far, Alpha seems to be right on track, and it's critical that it stays there," he said. "Any delays would make it look like vaporware."

DEC is also expected to provide detailed terms for leases and purchase plans to customers interested in buying a VAX today and moving to Alpha later on, said Terry Shannon, director of Gander Resources, a consulting firm in Ashland, Mass. "By buying now and getting in the queue for an Alpha upgrade, you could get an Alpha system sooner than someone who waits another year.

"I'm sure DEC is trying to buy some time to get their ducks in a row on Alpha, but I don't have time to listen," said Robert Cloninger, data processing manager at OK Industries, Inc., a poultry processor in Fort Smith, Ark. "My shop is growing too fast. It's a rude thing to say, but they can either keep up or they can get out of the way."

Marketing mavens?

Thrashing about for ways to revitalize its slumping sales, DEC last week tossed aside its engineering mantle in favor of a marketing orientation and threw the fates of three high-level executives in the air.

Just two weeks after DEC shocked Wall Street with a $300 million second-quarter loss, more evidence of DEC's inner turmoil materialized in the form of another corporate reorganization, which reverses the one it began two months ago [CW, Feb. 10].

"Digital says this isn't a knee-jerk reaction to the money troubles, but I think it very much is," said Thomas Rooney, an analyst at Donaldson, Lufkin & Jenrette Securities Corp. in New York.

Last's week executive shuffle gives the following vice presidents new duties:

- Charlie Christ takes over product areas that are key to putting DEC back in the black, including hardware and software for midlevel VAX lines, workstations, desktop computers and local-area networks.
- David Stone, a 22-year veteran and board member, heads up operating systems engineering and software development.
- Frank McCabe handles large VAX systems and enterprise-level networking.

The revamp also leaves three highly visible DEC executives dangling: William Strecker, former vice president of engineering; Dominic LaCava, former vice president of Unix-based software and systems; and Grant Saviers, former vice president of personal computer systems and peripherals. All three are said to be still employed and weighing their options.

Separately, DEC's decision to concentrate on marketing reflects a new mandate to respond faster to user demands, according to a spokeswoman.

KIM S. NASH

DEC seeks server edge via NT

CONTINUED FROM PAGE 1

high-performance platform," users and analysts pointed out how both products are still several months from shipping. Once they do start, Alpha and NT will land in the higher priced workstation and server space that is already a battleground for every major Unix system vendor. And DEC and Microsoft may have to wait a while for the payoff.

"This [combination] will take years to become mainstream," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. "People will tinker with it, find the bugs, test it out. You won't put mission-critical applications on a new operating system like NT."

Another issue Microsoft faces, Hurwitz added, is the chance that a booming success with the recently shipped Windows 3.1 may dilute any sense of urgency users feel about moving to NT.

"The thing that worries me is whether there are enough programmers in any of these companies to do all the things they're promising to do," said Dave Pensak, corporate adviser for computer technology at Du Pont Co. in Wilmington, Del. "The software development is still far more expensive than anyone will admit."

Whatever their internal concerns may be, DEC officials were forecasting sunshine in all directions last week.

"This is opening up a whole set of Alpha opportunities. We'll have Windows and Windows NT applications running on Alpha the same way they run on other RISC or Intel platforms," said David Stone, vice president of the software product group at DEC. With the Alpha CPU underneath it, Microsoft hopes to establish NT as the kind of robust operating system capable of handling power-hungry applications in science, engineering and business. The move should also strengthen NT's position as an alternative to Unix platforms, analysts said.

"I believe Microsoft also intends to provide a number of horizontal applications for NT that users can buy at shrink-wrapped places like Egghead Software," said Mike Kwatinetz, an analyst at Sanford Bernstein & Co. in New York. So far, approximately 580 software vendors have pledged to port to the Alpha platform, the most recent joiner being Oracle Corp.

Also last week, DEC announced an expansion of its systems integration, support, customer training and consulting service to include Microsoft products. Microsoft training courses and videos will now be offered at 145 DEC training centers worldwide.

"We're very excited about this announcement," said Sholom Bryski, vice president of distributed systems and networks at Bankers Trust Co. in New York, where the computing environment centers on IBM, DEC and a variety of PC platforms.

"Our PCs are so generic, there are very few vendors in that space of strategic value. The primary one has been Microsoft," Bryski added. "Anything we hear about interrelationships between two of these three companies is very important to us. It makes our integration job a lot easier."

DEC's Stone said the NT/Alpha strategy poses no threat to the VAX/VMS operating system. "I see them as complementary in different arenas," he explained. "People with VMS will want VMS on Alpha for their servers. If they want Windows servers, they'll want NT."

Given Microsoft's bumpy history of collaborative efforts, however, not everyone is convinced this marriage with DEC will celebrate its silver anniversary.

"Lots of people have been in bed with Microsoft, but they don't last," said Kevin Oberman, network manager of the engineering division at the University of California Lawrence Livermore National Laboratory in Livermore, Calif., a major DEC shop.

Grand plans: Products to come

Promises, promises — but no firm delivery dates or prices — were outlined last week by DEC and Microsoft in their latest round of agreements:

- DEC and Microsoft will jointly port Windows NT to Alpha platforms, with Microsoft making its Windows applications available on both Alpha and NT.
- Using Microsoft compilers, the pair will make applications written for Windows NT run on Alpha, Intel and Mips Computer Systems platforms. Microsoft will also provide a full set of Alpha development tools as part of the Windows NT Software Development Kit.
- DEC will port its DECtp Desktop for ACMS transaction-processing client environment to all Windows NT platforms — a significant step toward ushering NT into the on-line transaction processing arena.
- Microsoft will supply a DEC X server product for NT that enables interaction among X-based applications on Unix and VAX/VMS systems.
- DEC will extend its Pathworks PC integration products to include support for Windows NT clients and servers.
- The SQL Server Gateway for Rdb/VMS, a jointly marketed product available this July, will allow users of Windows applications to access corporate data residing in DEC Rdb/VMS databases. That will provide high-performance connectivity for more than 125 applications designed for use with Microsoft's SQL Server. The NT version of SQL Server may show up simultaneously with NT or shortly after its debut later this year, a Microsoft spokeswoman said.
- DEC will support Microsoft's Message Applications Programming Interface (MAPI) with its own X.400 mail products, eventually using MAPI as the primary interface for Windows message-enabled applications.
- DEC will also support the WINsockets application programming interface, providing transparent access to multiple networking transports such as DECnet/OSI and Transmission Control Protocol/Internet Protocol.

MARYFRAN JOHNSON

IBM shows its flexibility to financial users

BY THOMAS HOFFMAN
CW STAFF

PALM SPRINGS, Calif. — IBM last week introduced a suite of products and services to help financial services companies better link their functional departments to enterprisewide information networks.

The services and products, unveiled at IBM's Financial Industry Executive Institute Conference here, included educational and training services and connectivity software that work within IBM's Financial Application Architecture framework.

Some conference attendees were optimistic not only about the new offerings but about IBM's newfound flexibility with its installed base.

New attitude

"IBM's philosophy now is that they no longer dictate what application software you should install," said Judith Fisher, executive vice president and manager of the treasury group at The Huntington National Bank in Columbus, Ohio.

For example, the bank is now testing DR One, a Microsoft Corp. Windows-based application from BIS Banking Systems, a UK-based software developer and IBM business partner. DR One allows for the integration of "data feeds" of market data such as stock and securities quotes through services from Reuters, Telerate and Knight-Ridder, Inc. across Token Ring networks.

The software enables traders to use three screens at once while integrating Lotus Development Corp. spreadsheet applications, which Fisher said is key. "It gives us a leg up and competitive edge to have our portfolio strategies executed better."

More choices

Among the new offerings from IBM are Data Model Services, a set of applications and services devised to reduce costs associated with application development, maintenance and operations. IBM executives said the services enable customers to integrate departments such as retail and wholesale banking, trading-floor operations and trust systems. The services include education, training, feasibility studies and customization and installation of model-based applications and databases.

Tom Hudson, senior vice president at IBM with worldwide responsibilities for the finance industry, said Data Model Services represents the largest investment IBM has made in recent years for its financial industry customers, though Hudson said he would not specify the cost of the services' development.

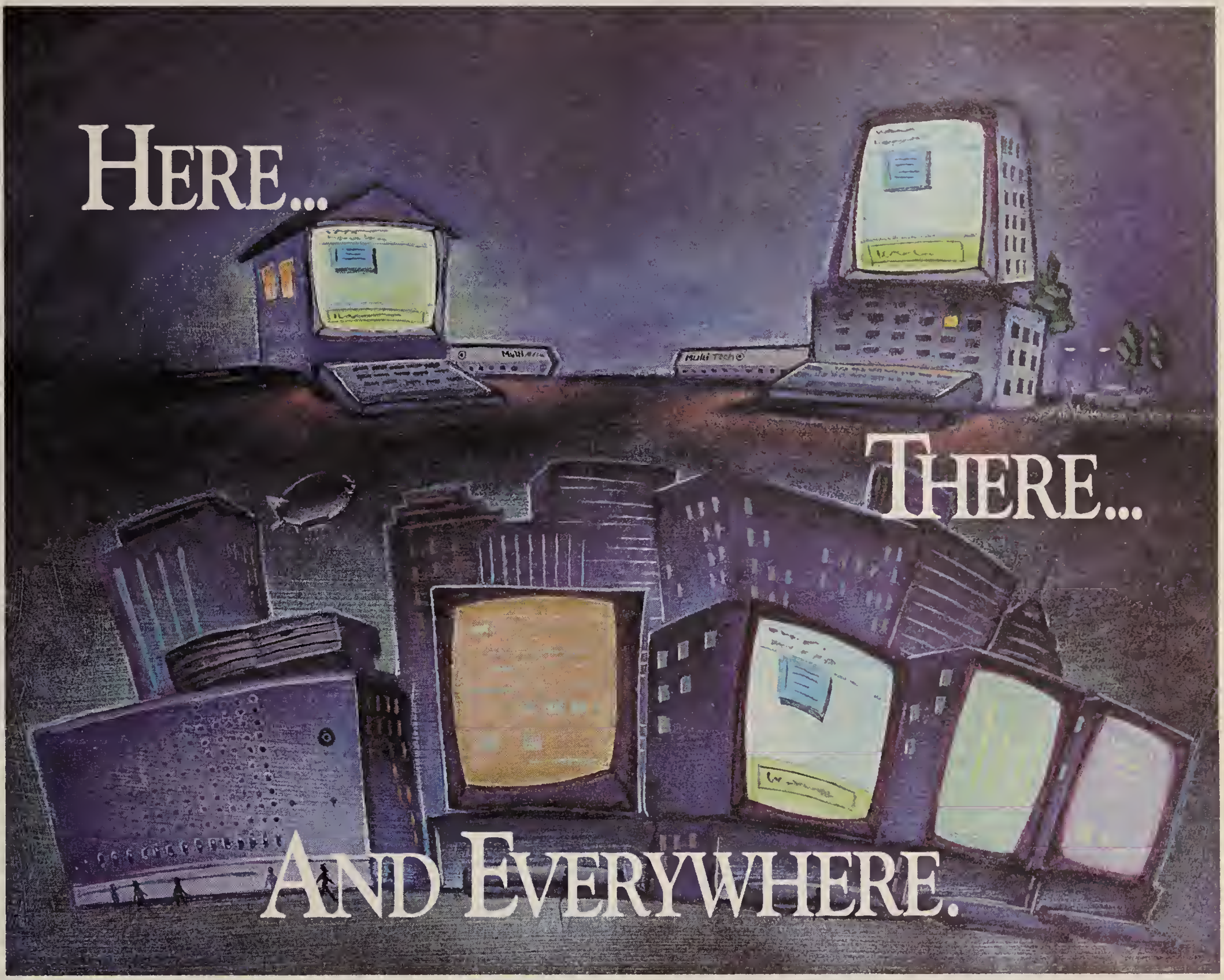
Financial services is IBM's single largest vertical industry market, comprising 17% — or $12 billion — of IBM's annual revenue.

IBM also rolled out a suite of services called Application Connectivity Services, which were designed to facilitate information sharing across the enterprise by integrating applications and databases via networks.

The services are marketed in conjunction with software applications such as DataTrade, an MVS/ESA-based connectivity software application that simplifies communications between back-office operations and trading rooms at financial institutions. DataTrade includes an application programming interface that enables programmers to code regardless of operating systems, hardware platforms and network requirements.

DataTrade can be used on IBM System/390, IBM Personal System/2, RISC System/6000 and System/88 platforms, as well as on Sun Microsystems, Inc. SPARCstations.

All products and services are available from IBM now. Pricing depends on system configuration and customization.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NEWS SHORTS

RAID targets AS/400

Storage Technology Corp.'s subsidiary XL/Datacomp, Inc. unveiled what is said to be the industry's first redundant arrays of inexpensive disks (RAID) storage subsystems for the IBM Application System/400. The Alpine 9600 Storage Manager slides into place behind Storage Tek's Iceberg 9200, a disk array subsystem for IBM mainframes unveiled in January. The $200,000 to $500,000 Alpine, which is compatible with IBM's 9336 storage subsystem, provides data capacities of 10G to 25G bytes and will begin shipping in the third quarter.

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IBM tweaks RS/6000 line

IBM will ship a high-end RISC System/6000, the Model 970, in June. Pricing starts at $97,000 for the new box, which delivers double the expansion capability and nearly twice the disk storage of the existing high-end server. IBM claims the Model 970 will be the first system to break the 100 SPECmark performance rating, giving it the highest benchmark results in the industry for a single-processor system. The 970 also sports new chip technology and enhancements to the Micro Channel I/O bus.

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Another net loss for Wang

Wang Laboratories, Inc. posted a third-quarter net loss of $6.3 million on quarterly revenue down 6% year-over-year to $461 million. A $6.4 million operating profit shone in contrast with a $45.1 million operating loss logged in last year's comparable quarter, but it dimmed in that the gains were driven by sales of real estate, not technology. "Clearly," Sherwood Research Group analyst Stephen Dube said, "Wang is just not putting it together."

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Korean DRAM dumping charged

Micron Technology, Inc., the sole remaining U.S. maker of dynamic random-access memory, filed an antidumping petition with the U.S. Department of Commerce and the International Trade Commission against Korean makers of 1M-bit DRAM and other components. Specifically singled out were Hyundai Electronics Co. and Goldstar Electron, Inc.

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Computer export controls relaxed

The Bush administration will relax licensing requirements on the sale of computers to Western Europe and Japan now that the Cold War is over. Special export licenses will no longer be required for the sale or resale of computers among nations that cooperate with the Coordinating Committee on Multilateral Export Controls (Cocom). Supercomputers were excluded from the Cocom decontrol list because they have military applications. The administration also expanded the types of computers that are preapproved for bulk shipments.

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Short takes

Cisco Systems, Inc.'s Release 9.0 router software is slated to ship this week. . . . **Hewlett-Packard Co.** last week agreed to sell and support its industrial automation software tool kit on **Sun Microsystems, Inc.** SPARCstations under the upcoming release of Solaris 2.0. . . . **Epoch Systems, Inc.** rolled out its EpochBackup software, reportedly bringing mainframe-class automated backup capabilities to Unix networks. Available next month, the software is priced from $5,000 and runs on standard Unix platforms. . . . The **Open Software Foundation**'s OSF/Motif 1.2 graphical user interface is now generally available. Motif 1.2 offers multibyte and wide-character support for Chinese, Korean, Japanese and other complex character sets. . . . **Digital Equipment Corp.** will start licensing its patented Digital Storage Systems Interconnect bus technology. The first licensee is CMD Technology, Inc. in Irvine, Calif. . . . **Digital Communications Associates, Inc.** (DCA) finalized its acquisition of **Intercomputer Communications Corp.** for $8.2 million. DCA, located in Alpharetta, Ga., also paid $13.5 million worth of stock. . . . **Texas Instruments, Inc.** is shipping a version of its Information Engineering Facility to **Tandem Computers, Inc.** NonStop Systems.

Pilot may up cellular data traffic

CONTINUED FROM PAGE 1

Unfortunately, New York Life's trials with Ardis' nationwide radio frequency data network did not work as well as expected, according to Tom McCarthy, the company's assistant vice president of telecommunications.

Despite the setback, McCarthy said he was sure his company would evaluate IBM's data-over-cellular technology. But he added, "It'll have to be at an acceptable speed and price."

Among the cellular executives placing the announcement in a suitably historic context was Bruce R. DeMaeyer, president of Ameritech Mobile Communications, Inc. He noted that voice over cellular was only an experiment "a short 10 years ago."

DeMaeyer said he envisioned an $8 billion to $10 billion market serving 13 million subscribers by the year 2000. The cellular industry currently claims about 7 million subscribers.

Along with McCaw and Ameritech, the other participating carriers are Bell Atlantic Mobile Systems, Contel Cellular, Inc., GTE Mobilnet, Nynex Mobile Communications, PacTel Cellular, Southwestern Bell Mobile Systems and US West.

All rolled into one

Industry analysts, meanwhile, said the real significance of the technology is its promise to integrate voice and data applications on a single wireless network.

"It's the guy who wants to send a fax, receive E-mail and make a phone call [all from the same device] that will make this market," said Paul Callahan, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Analysts agreed that to exploit this potentially ubiquitous wireless transport medium, applications will be key. How quickly manufacturers and application developers step up to the challenge will have a major impact on the success of the approach outlined last week.

"The real question is not the basic technology but the providing of applications software and integration with portable devices," said Ira Brodsky, president of Datacomm Research Co. in Wilmette, Ill.

Problems to overcome

The carriers and IBM have plenty of technical hurdles ahead of them. Some said the cellular companies' entry en masse into the wireless data market may muddy the waters because some of the players already support other wireless data approaches, adding a new set of alternatives for users who are only now starting to consider wireless as a medium for their data.

Up until now, the nation's $9 billion cellular network infrastructure has not been popular for data services, with data representing less than 2% of all cellular traffic, according to industry experts.

The problem has been twofold. First, the circuit-switching architecture of these analog systems, while appropriate for voice calls, is not ideal for bursty data traffic. Second, the per-minute billing scheme of cellular systems makes short data transmissions such as sending and receiving electronic mail more expensive than the data-only packet radio networks.

IBM's CelluPlan II technology involves sending packet data over cellular voice frequency channels at 19.2K bit/sec. during moments of "idle" time. A flexible data radio is used at each cell site to seek out unused voice channels, send data and then "hop" off before the channel is again needed for a circuit-switched voice call.

Because IBM's solution is an "overlay" network that requires little in the way of hardware at individual cell sites and no new radio spectrum, it can be deployed very quickly, according to executives at the participating cellular carriers.

But Robert Rosenberg, president of The Insight Research Corp. in Livingston, N.J., was more cautious. "It seems to me that pure radio frequency technology is easier to implement than the scheme proposed here," he said. "Everyone realizes that wireless data communications will have spectacular growth through the end of the decade. . . . I just question whether analog cellular is the vehicle for it."

Meanwhile, the consortium could pose a threat to two competitors. Conspicuously missing from the consortium was the cellular arm of Atlanta-based BellSouth Corp. In January, BellSouth invested $300 million to take a 49% share of Ram Mobile Data, Inc., a New York company building a nationwide packet data radio network using the European Mobitex standard.

A second wireless data network provider potentially damaged by last week's announcement is Lincolnshire, Ill.-based Ardis, the 2-year-old Motorola, Inc. and IBM joint venture. Ardis claims a wireless network that covers some 8,000 cities and towns.

Sears to test mobile phone for voice/data use

IBM's CelluPlan II technology suggests the possibility that "voice and data can now come together in the same mobile instrument," said Gary Weis, senior vice president of networking and technology services at Sears Technology Services.

Sears Technology, the information systems arm of Sears, Roebuck and Co., stepped forward last week as the first major field customer for a test of the data-over-cellular system proposed by most of the nation's top cellular companies this summer in a San Jose, Calif., trial.

Sears Technology said it would examine three main applications:

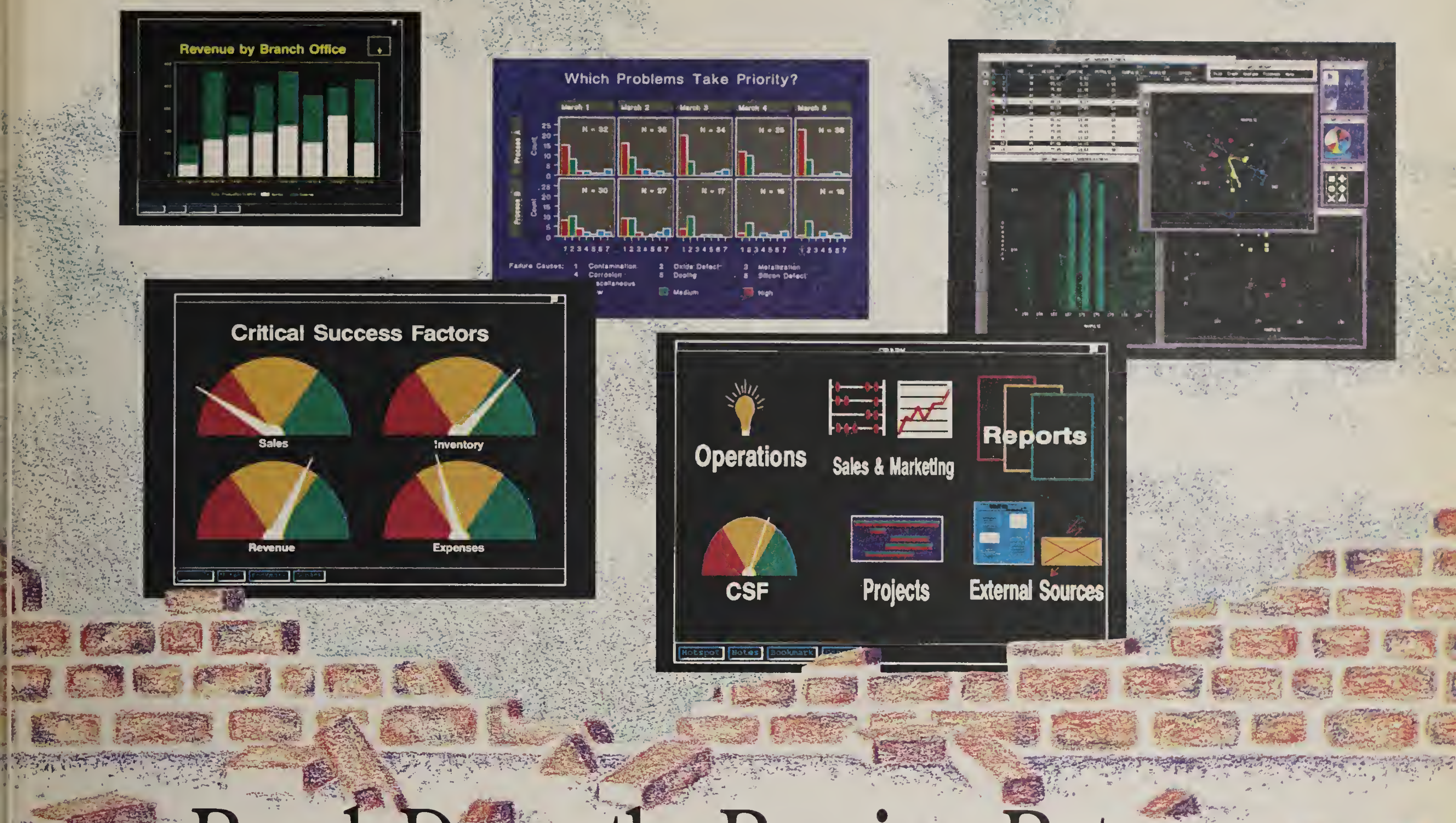
- An integrated device combining a cellular telephone with a laptop, which would replace the mixture of laptops, cellular telephones and beepers used by Weis' own staff today.
- A messaging system to help fix the position of Sears Technology delivery trucks in the field.
- A platform for Sears Technology's highly mobile professional staff members, some of whom "literally don't have an office today," Weis said. In addition, Sears Technology will look into the use of the data-over-cellular system for point-of-sale and security applications.

While executives from the nine cellular companies pronounced the technology as a "historic" event on par with the introduction of the telephone, Weis remained pragmatic.

"In the final analysis," he said, "the overall cost" of the service and the supporting terminal gear will determine whether Sears Technology buys into the approach. Even if, as expected, carriers choose to bill on a per-data packet basis, "the price per packet is not a trivial issue," Weis said.

As of last week, the participating cellular companies were keeping mum about the ultimate prices or pricing structures of the CelluPlan II-type systems they may soon deploy.

ELLIS BOOKER



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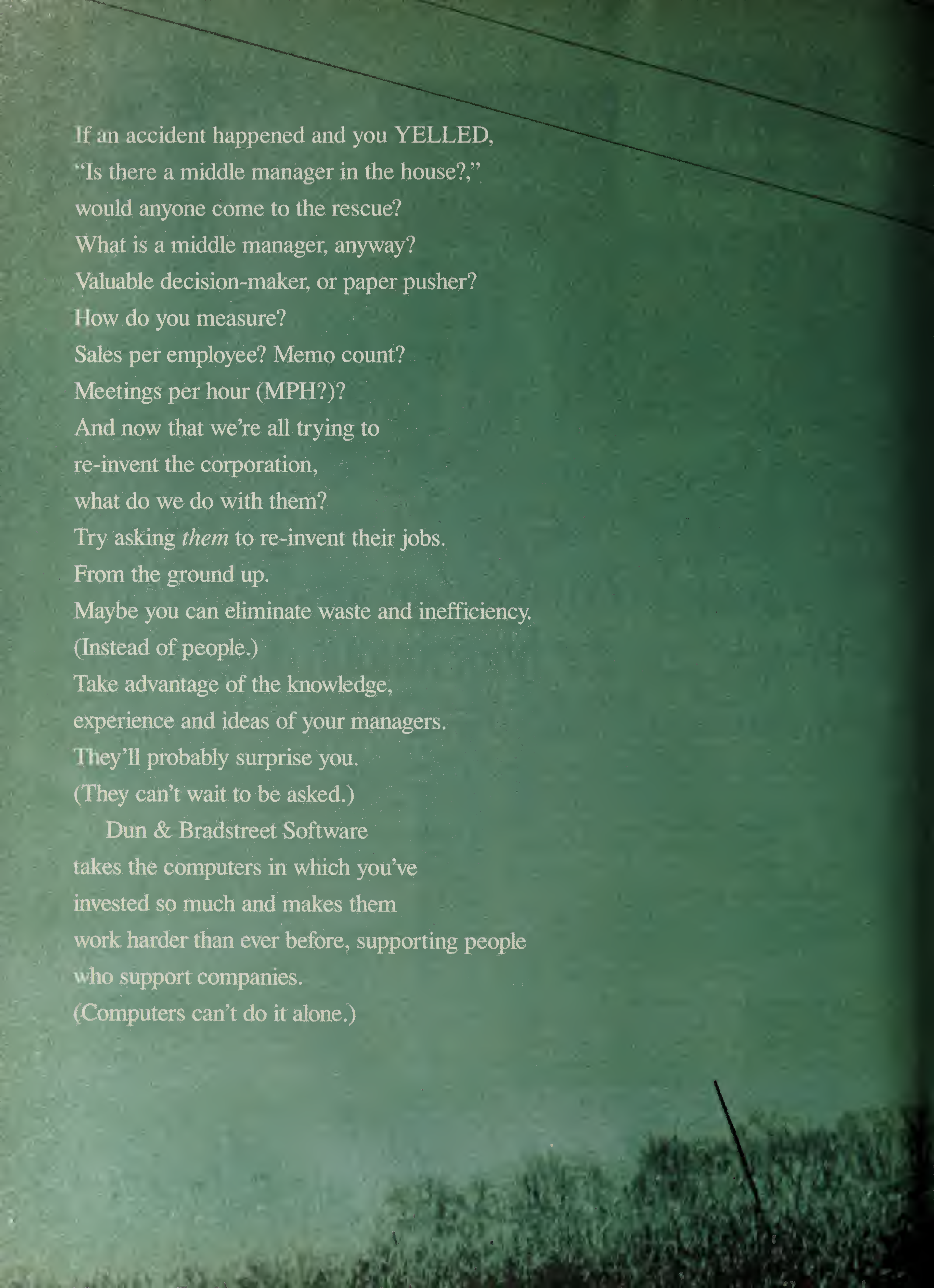

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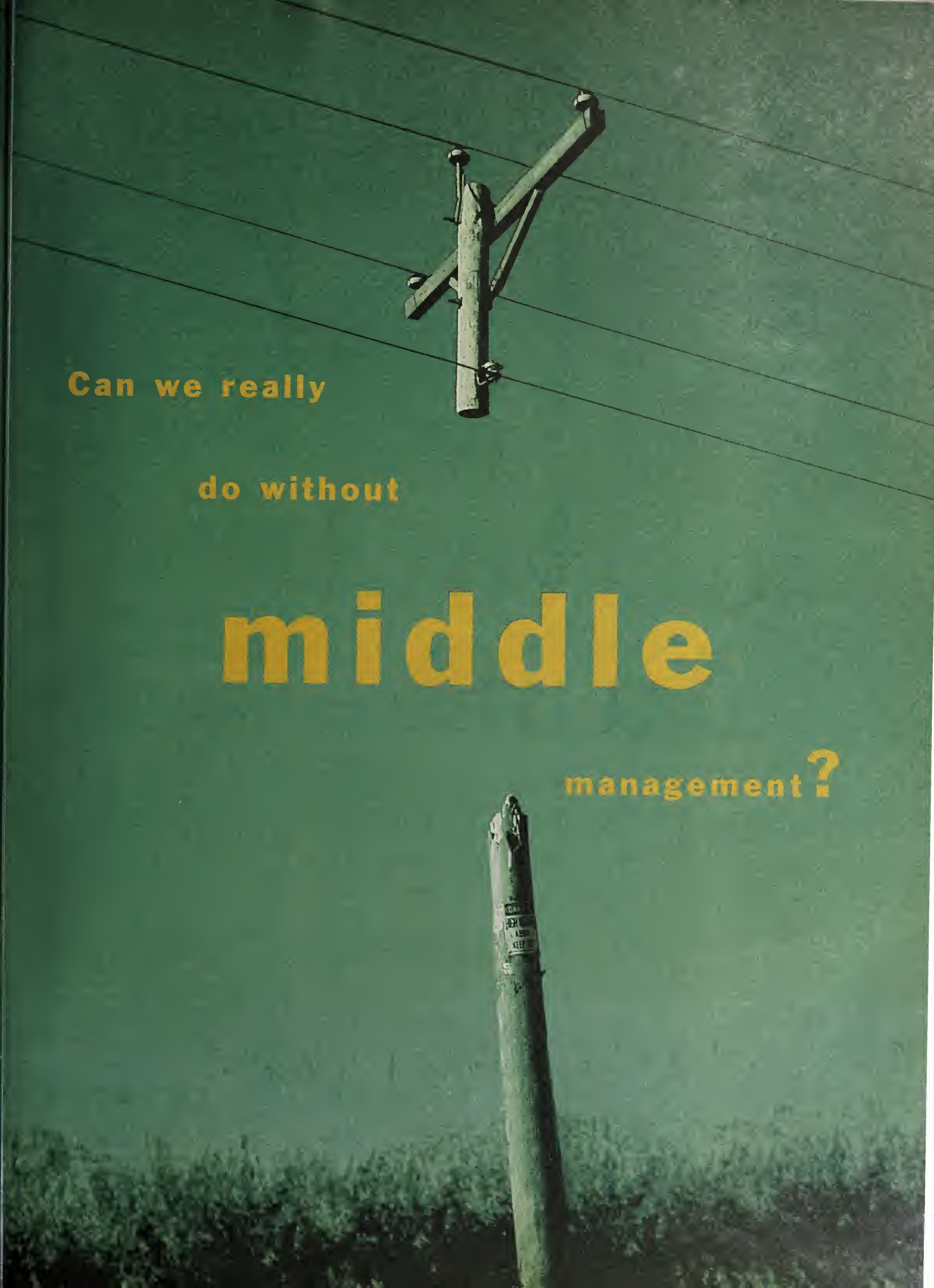

Police use informant to investigate thefts of phone/credit card numbers

BY MARK HALPER
CW STAFF

SAN DIEGO — Police here are investigating what they said is a nationwide gang of thieves who break into computers, steal credit card and phone calling card numbers and then use them to make illegal purchases.

The suspected thieves have infiltrated computers at Equifax Credit Information Services, Inc. and other companies by using illicitly obtained access codes they allegedly posted on bulletin boards across the country, said Bill Robinson, a spokesman for the San Diego police. Robinson did not provide the names of other companies victimized by the ring.

Equifax spokesman John Ford said last week that 12 valid credit card numbers from Equifax's computers have fallen into unauthorized hands, but he declined to estimate the value of illegal purchases made using those numbers.

Equifax, an Atlanta-based $1.1 billion credit reporting agency, maintains a data center in Atlanta that houses two Amdahl Corp. 5990-1400 mainframes, an Amdahl 5890-600E mainframe, an IBM 3090-300 and two Digital Equipment Corp. VAX 6500s.

Details of the San Diego case are sketchy. Robinson said San Diego police are working with an informer who is part of the chain but has not been charged. Police found the informer, a minor, in a San Diego motel in possession of "computer-related material," including computer manuals, Robinson said.

One source said police took the informer to a San Diego computer store where he demonstrated how to crack the Equifax system.

Police said they believe that about 1,000 users nationwide have access to codes through the ring and that approximately 100 have actually used the codes to obtain card numbers [CW, April 20]. The case is similar and possibly related to one in Dayton, Ohio, Robinson said.

In the Dayton case, police arrested two minors in February on charges of stealing phone card numbers from LDDF Communications, Inc., a Jackson, Miss., long-distance service provider. The two suspects are believed to be part of a group that also has access to Equifax computers.

Working together

San Diego and Dayton police are sharing information, and various offices of the Federal Bureau of Investigation and the Secret Service are also keeping an eye on developments. The Secret Service has jurisdiction over computer crime cases involving unauthorized use of access codes, but so far it has elected not to duplicate the FBI's investigation.

Reports that the San Diego investigation has led to the confiscation of computer equipment in New York, Philadelphia and Seattle could not be confirmed.

As a rite of passage into "elite hacker" status, ring members are often encouraged to obtain computer access codes, which are then posted on bulletin boards specializing in such information.

"It's a feather in their cap," said detective Tom McEwan at the Kettering Police Department in Kettering, Ohio. McEwan participates in the Dayton police department's computer crime investigations.

Tale of two gatekeepers

Equifax Credit Information Services is trying to determine how its computer access codes got into the wrong hands.

Ironically, at the time of the break-ins, the company was in the process of upgrading its security system by implementing more complex security codes, spokesman John Ford said.

The company is considering installing an artificial intelligence-based system that would detect unusual patterns of access. In addition, Equifax is considering whether to record information in a manner that would render it useless should it fall into unauthorized hands, Ford said.

TRW Information Services, Inc. in Orange County, Calif. — a competitor that said it is not part of the San Diego investigation — already uses an AI-based measure like the one under consideration by Equifax. A TRW spokeswoman said the company uses the AI program to detect unusual access to TRW's Amdahl mainframes at its data center in Anaheim, Calif. The program, called Discovery, was developed by a TRW sister company, she said.

TRW also gives its clients the option of using terminals with embedded passwords that only users sitting at the terminal can use. TRW resells terminals, supplied by Microbilt in Atlanta, that include the embedded passwords.

MARK HALPER

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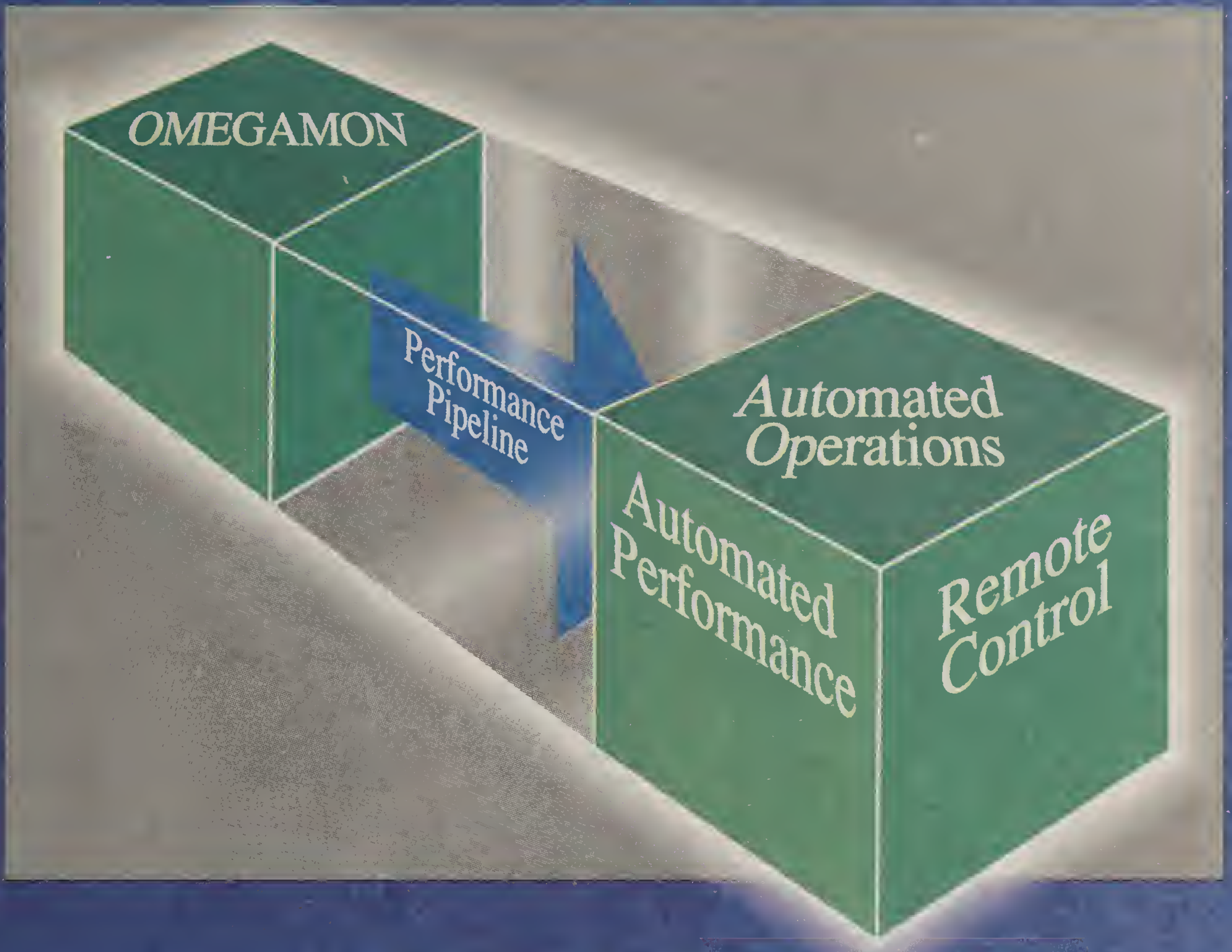

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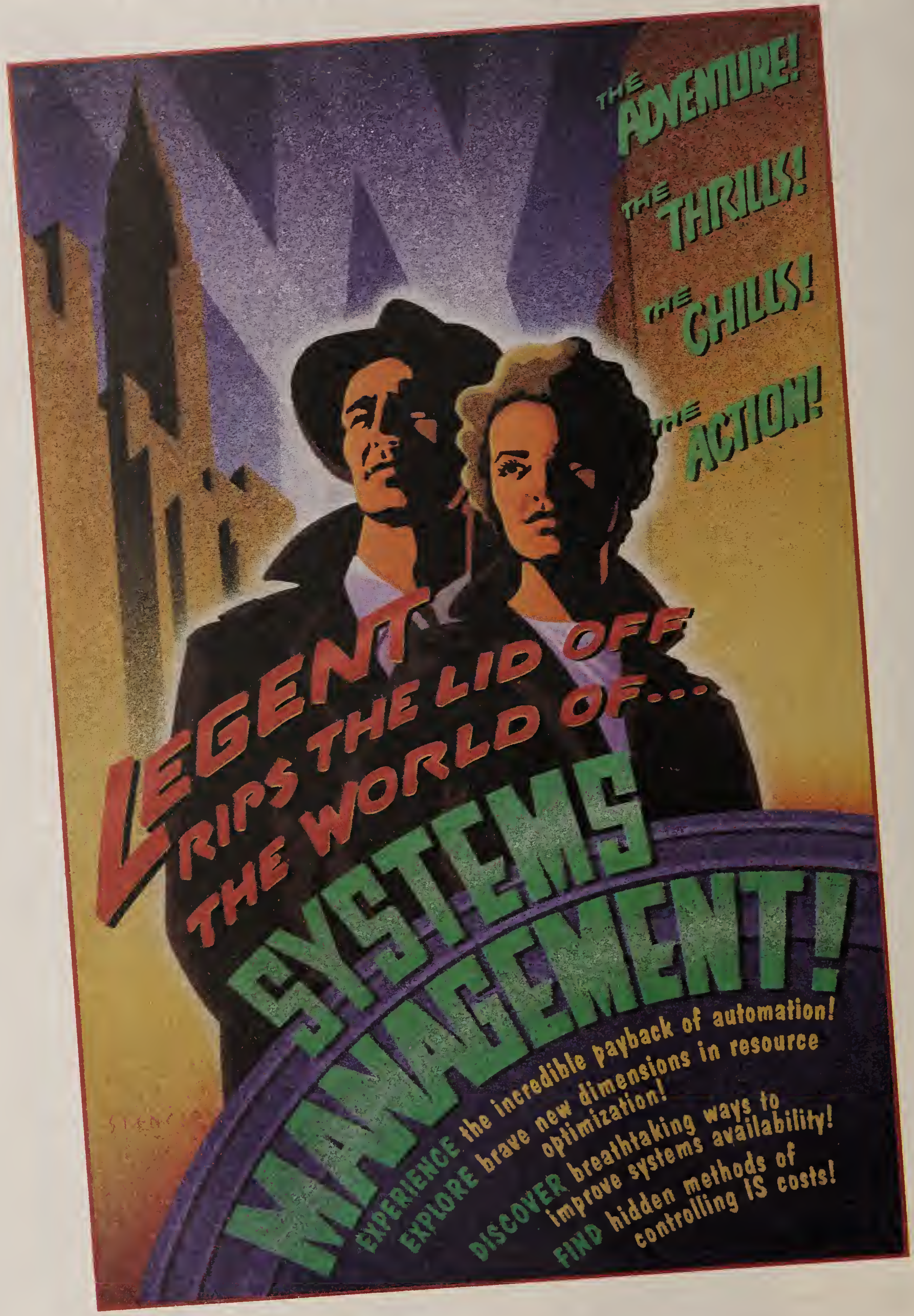
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CONTINUED FROM PAGE 1

and lowering turnover, absenteeism and health insurance costs.

As varied as the programs are, they all reflect the industry's willingness to try new approaches. Tom Stypulkowski, senior director of corporate compensation at Automatic Data Processing, Inc., said, "Rather than riding the old systems, we have to come up with some creative ways of paying for performance."

This is possible, in part, because U.S. software and services firms with annual sales of about $500 million pay their chief executive officers, on average, $430,000 per year — roughly 10 times the average of all employees' pay, according to James T. Brinks, consulting partner at Atlanta-based Culpepper and Associates, Inc.

Conversely, for public companies of that size in other industries, that multiple falls between 12 and 15, Brinks said.

Tough times

Manufacturers typically compensate CEOs at higher levels than do software firms, but Brinks and other compensation gurus said egregious abuses are rare there as well, in part because hardware firms have hit hard times.

Rather than harvest profits into bloated executive pay packets, a number of computer companies are plowing new ground in human resources programs. Young corporate cultures marked by egalitarianism and innovation have led to trailblazing experiments in nonmonetary pay and perquisites, said Richard Wonder, national director of the information systems division of Robert Half International, Inc.

In interviews with 20 hardware, software and services firms, *Computerworld* found numerous examples of such innovations. For example, Stratus Computer, Inc. in Marlboro, Mass., is conducting a six-month experiment to see if it can improve the health of 23 high-risk volunteers with problems such as obesity, high blood pressure and high cholesterol.

The employees received health counseling, and some employees showed measurable health improvements after just two months, according to Tom Harrison, manager of corporate benefits and services. "If we can turn around just one of those cases, we've paid for the program threefold."

Apple Computer, Inc. helps workers navigate the legalities related to child adoption, and Unisys Corp. awards four $1,000 bonuses per month to personnel praised in customer surveys.

Economic role

There is more than just benevolence at work here. Economic woes have also spurred human resources' ingenuity. "You're still seeing a lot of company downsizing, but you can only get rid of so many people and still make the box," said Joseph Rich, high-tech practice leader at William M. Mercer, Inc.'s Boston office. "So the drive to become more competitive is passing through to compensation and human resources policies."

To motivate employees, a number of companies are pushing stock option plans lower into the organization. Adobe Systems, Inc. gives all employees, even the most junior, stock options as of the day they are hired, and Computer Associates International, Inc. makes options based on job performance available to all.

Other firms are adjusting salary programs. Data General Corp. and others have developed a "broadband" approach to job ranking in which a few pay classes with wide salary ranges — or none at all — replace many pay grades with narrow scales. The result: more flexibility to reward top performers while saving money on mediocre players, according to Joe Dugin, head of DG's human resources department.

"The aggressive merit increases of the '80s are gone," said Scott Sharpe, human resources vice president at Computer Sciences Corp. "If you're not a performer, there is no guaranteed increase for you."

Companies that once flew high are adopting more sober policies with which to face cloudy futures. Alliant Computer Systems Corp. in Littleton, Mass., was forced to "trim" basic medical benefits and cut the pay of its 250 employees for 1991's fourth quarter, said Mike Jean, vice president for human resources and administration. Jean, a hired gun brought in eight months ago to find ways to lift morale at the financially troubled firm, started a staffwide profit-sharing plan in January.

Benefits buffet

Adobe recently became one of the few software companies to offer a "cafeteria" benefits plan. Employees get an average $400-per-month allowance to spend on a menu of insurance and dependent-care options. Unused money is then paid out to employees in cash.

This a la carte approach is "the only sound way" to address an increasingly diverse work force at Apple as well, according to Kathleen McEnroe, manager of employee services.

Today's family-oriented workers from varied ethnic backgrounds demand different care and feeding than did the company's original young, single staff, she explained. "Management is allowing us to offer a lot more programs than in the early days and pay for them on a case-by-case basis," McEnroe said.

As the work force ages, "long-term care is becoming the thing for the 1990s," said William Cripe, human resources vice president at Reston, Va.-based Software AG of North America, Inc.

BIG IDEAS

Among the more innovative or liberal approaches to employee benefits are the following programs from an assortment of high-tech firms:

- **Apple Computer, Inc.** offers employees a six-week paid sabbatical after every five years of employment.
- **Lotus Development Corp.** extends medical and other insurance coverage to the 'spousal equivalent' partners of homosexual employees – a step that is virtually unparalleled in any sector of the business community.

- **Stratus Computer, Inc.** is conducting a six-month counseling experiment to see if it can improve the health of 23 volunteers with high-risk problems such as obesity, high blood pressure and high cholesterol.

- **Amdahl Corp.** is piloting a team pay concept in its manufacturing unit in which an individual's compensation is based in part on the performance of co-workers.
- **SAS Institute, Inc.** will put a program in place in July offering on-site geriatric counseling and more flexibility to workers with aging relatives.

- **Adobe Systems, Inc.** lets employees buy more insurance coverage with pretax payroll deductions or up to five additional vacation days at their regular salary rate.

One for all

"Alternate reward systems," including team pay and skills-based pay, is under consideration at Convex Computer Corp.

Worker teams have been established in manufacturing, but the compensation scheme hasn't been quite worked out yet, said Carla Townsley, manager of compensation and benefits at the Richardson, Texas-based vendor.

As much as 80% of a team member's pay eventually may hinge on the group's attainment of production and quality objectives, according to Townsley.

Convex is also considering a plan that might improve product quality. It would let developers share in the success of products, probably in the first two years of the life cycle. Awards could include stock options or cash.

Like many high-technology firms, Convex has a corporate culture that stresses egalitarianism. For example, all offices are the same size. There are no reserved parking places. All employees with more than a year of tenure share in the company's profit-sharing plan, and all get exactly the same amount if awards are given.

GARY H. ANTHES

The family away from home

Three times a week, a truck moves through the 200-acre campus of SAS Institute, Inc. in Cary, N.C., making deliveries to the company's 1,500 local employees. On Mondays, they get fresh fruit, on Wednesdays, M&Ms and on Fridays, breakfast rolls or donuts.

SAS also offers the largest privately owned child-care facility in the U.S., with 80 full-time Montessori instructors who care for 290 children at no cost to employees. The software developer also runs an award-winning, subsidized gourmet cafeteria, where a woman plays the piano at lunchtime; staffs a health care center with five nurses, a consulting physician and a staff nutritionist; and operates a recreation and fitness center.

These perks have not gone unnoticed outside of SAS. For the past three years, *Working Mother* magazine has named SAS one of the top 10 companies for working mothers, and last year the company was among the 16 most "family-friendly" U.S. companies in the book *Companies that Care* by Hal Morgan and Kerry Tucker.

Privately held SAS says the payoff from its largess is happier and healthier employees. SAS' numbers speak for themselves: The company's 1991 turnover rate of 5.9% was about one-third the software industry average.

GARY H. ANTHES

Flex time!

In an effort to promote free thinking and individual responsibility, Oracle Corp. took the almost unimaginable step of setting no work hours for its 3,500 U.S.-based employees.

Every worker can come and go — or not come in at all, opting to telecommute — as he pleases. Oracle pays for and installs terminals and modems in every employee's home so that "they never have to come into the office if their job doesn't require it," said Rand Weston, vice president of human resources. Also highly unusual is Oracle's policy not to monitor vacation time. Workers are free to take as much time off as they wish, as long as their projects come in on time.

Oracle also lets employees in its California offices pursue graduate degrees — on company time — from nearby Stanford University. Under the program, classes are piped into learning centers at the company via satellite television.

This laid-back approach must be working. Oracle's attrition rate among software developers — the bulk of its staff — is 5%, compared with a 10% to 12% rate at rival firms, Weston said.

KIM S. NASH

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ADVANCED TECHNOLOGY

Virtual reality seeks practicality

Firm's drive toward real-world applications shows promise of potentially big market

BY CLINTON WILDER
CW STAFF

In an embryonic technology field filled with hype and promises, Telepresence Research is trying to bring some reality to virtual reality.

Palo Alto, Calif.-based Telepresence has carved out a niche as a "virtual reality integrator" that will customize virtual environments for specific business, scientific and entertainment applications. The 2-year-old firm views itself as a bridge between technical advancements and real-world users.

"You can build technology forever, but it seemed to me there was a huge unfilled niche of what you actually do with it," Telepresence co-founder and managing director Scott Fisher said. "You should look at the experience or environment that the user requires first, then design the platform. One of the best things about this technology is the ability to personalize it."

Telepresence is working with Japanese electronics giant Matsushita Electric Industrial Co. on a project that will allow consumers, possibly within the next two years, to browse for products in a "virtual showroom." From a remote location, a customer will be able to view and direct a mobile, wide-angle lens camera along rows of product shelves in a Matsushita warehouse.

The system, which uses a viewing device from Telepresence's strategic partner, Fake Space Laboratories in Menlo Park, Calif., can also be used for in-store security monitoring from a remote location. Crystal River Engineering, Inc. in Groveland, Calif., is also part of the Telepresence Alliance.

Another virtual reality application allows an aircraft wing designer to use his own hand motions to simulate the flow of air across the wing surface. This "virtual wind tunnel" application is currently in use at the National Aeronautics and Space Administration Ames Research Center at Moffett Field in nearby Mountain View, Calif.

Telepresence Research

Telepresence *is a "virtual reality integrator" that will customize virtual environments for specific business, scientific and entertainment applications*

Telepresence is one of several Northern California start-up virtual reality companies founded by former NASA Ames researchers. From 1985 to 1990, Fisher directed NASA Ames' Virtual Environment Workstation Project, which pioneered telerobotics applications for future use in spacecraft and space stations. The other Telepresence co-founder is Brenda Laurel, a former consultant to Apple Computer, Inc., LucasArts Entertainment and Carnegie Mellon University.

Proof positive

Telepresence's drive toward practical applications "is proof to me that the virtual reality market is beginning to show short-term potential," said Paul Saffo, research fellow at the Institute for the Future, a Menlo Park, Calif.-based firm that tracks advanced technology trends.

"First we went through the blue-sky phase, then the tool-building phase — now we're beginning to see what we can do with applications," Saffo added. "Although full-blown, fully robust virtual reality applications are a ways off, there is no doubt that there are smaller practical applications today. [Telepresence] is a unique little company with strong resources to make them happen."

A key component of telepresence is sound, and Telepresence Research is heavily involved in acoustic modeling — duplicating the human hearing process in a virtual environment. As users manipulate their way through the environment, sounds change "direction."

One practical application of acoustic modeling is architectural design. A designer or architect can test how different structural configurations, building materials or partition positions affect the acoustics of a room or open space. However, current technology limits sound to four to six specific sources per virtual environment, according to Fisher. Telepresence has developed a working prototype of such a system for one of its clients.

A potentially huge virtual reality market of interest to the information systems community is information visualization. The concept leaps beyond graphical user interfaces and multimedia and actually puts a user "inside" a database from which he can select or organize information with hand and body movements.

Fisher said he sees a possible application of information visualization in jobs where workers must react to vast amounts of data. "The challenge is, how can you redisplay that to make better decisions?" he asked. "Navigating through data is usually not a fun experience."

Fisher worked on information visualization prototypes at NASA Ames but said real-life applications are several years away. Telepresence finds a lot of misperceptions about virtual reality among its potential customers.

"We have to get people calibrated away from what they see in *Lawnmower Man*, for example. We're trying to bring some reality to this field," Fisher said.

Telepresence Research and Crystal River Engineering, Inc.

Virtual reality *is a concept that leaps beyond the screen image and actually places the user 'inside' the database*

TECH TALK

Keeping count

■ Try beating this one on your handy-dandy pocket calculator. Researchers at AEA Technology's Harwell Laboratory in Harwell, UK, have discovered the largest known prime number. It took 19 hours of calculation on a Cray Research, Inc. Cray-2 supercomputer at Harwell Laboratory to find the 227,832-digit number, which is designated as $2^{756839} - 1$. That figure is three times higher than the previously known highest prime number. The Harwell researchers asked a team of U.S. researchers to verify the find. The U.S. team included officials from Cray, the U.S. government, Next, Inc., Dartmouth College, the Houston Area Research Consortium, Reed College and Thinking Machines, Inc. They used Cray software on a Cray-2 at the San Diego Supercomputer Center.

Beyond Red October

■ Massively parallel computers may have found a home in the antisubmarine warfare group at Lockheed Missiles and Space Co., but now Lockheed is looking for new ways to use the technology. Lockheed has been using a system from Wavetracer, Inc. in Acton, Mass., in its McLean, Va., ASW Systems Center. Follow-on plans call for Lockheed's Advanced Computing Laboratory to install a second, 8,192-processor Wavetracer machine in its effort to apply massively parallel computing technology throughout Lockheed.

Building neural nets

■ Toshiba Corp. in Tokyo has claimed a breakthrough in the development of neural networks. Toshiba has come up with a modular approach in which each module is a self-contained neural network. The company said that stringing together such modules makes it easier to assemble larger, high-performance neural nets because the rest of the modules are isolated from an error that may occur in a single module.

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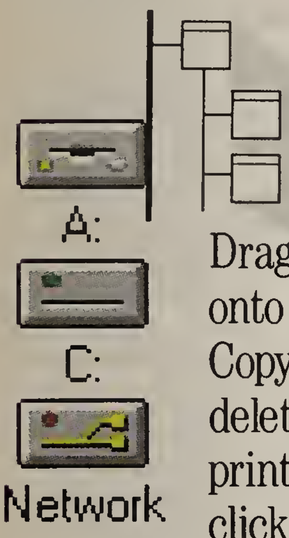

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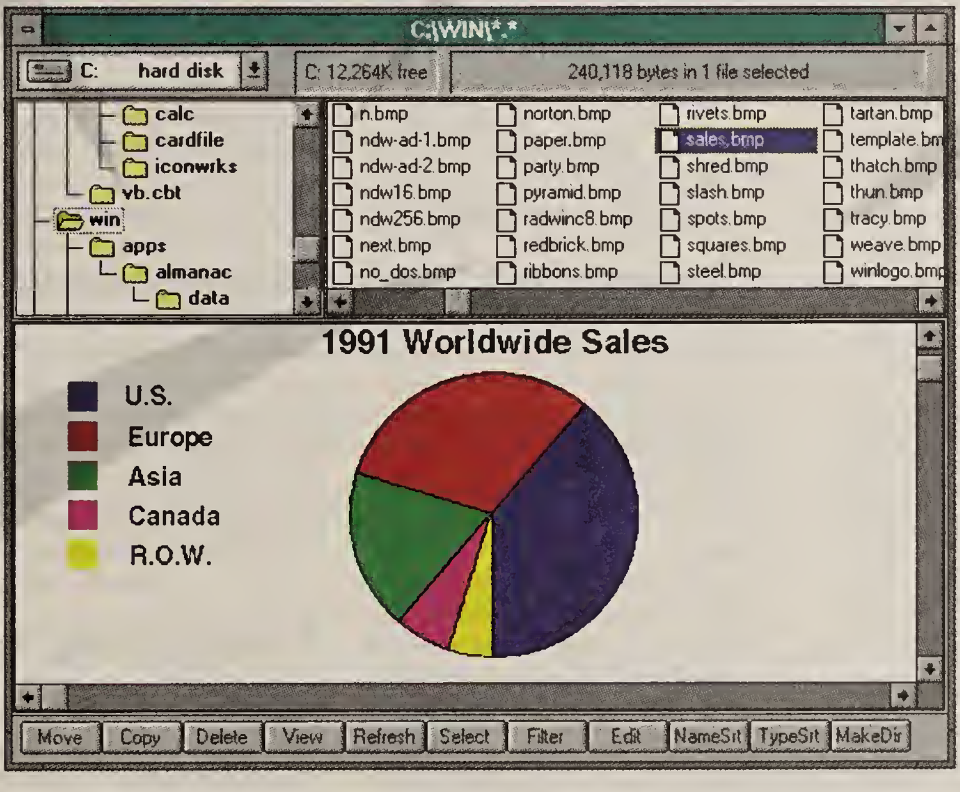

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EDITORIAL

Soft talk

A few weeks back, we received a copy of a letter that an IS manager had written to a software vendor. In the letter, the manager expressed his outrage at having received a six-figure bill for the upgrade of several software packages for his firm's mainframe.

In the not-so-distant past, the case might have been closed right there. Bill mailed, complaint registered, bill paid. Have a nice day.

Only this time, there was a twist. The user's complaint reached the highest offices at the vendor. A new bill was mailed out that was tens of thousands of dollars less than the original. It seems there's at least one user out there who's a lot happier today than he was previously.

And he's also a lot wiser, for he recognizes the emerging user-driven marketplace. The news earlier this month that Computer Associates had made sweeping changes to its pricing and customer support policies was to some extent the manifold expression of this reality.

For CA, the radical pricing changes will give the software giant at least a temporary advantage over other mainframe systems software companies, whose pricing strategies still don't reflect users' predilection for distributed computing. We suspect that Legent and IBM are accelerating efforts to overhaul their own pricing schemes in the wake of CA's move.

CA's plan is surprisingly innovative, given that the company heretofore downplayed the hue and cry of its customer base. Specifically, CA's plan dovetails with customer moves toward downsizing, mainframe consolidation and maintenance cost reduction.

CA's moves are emblematic of a much wider trend. Compaq, which for years just rammed products through third-party channels, is growing an in-house customer support group. Users from Sun and network vendor Banyan have put those companies on notice that they'd better pay closer attention to support issues.

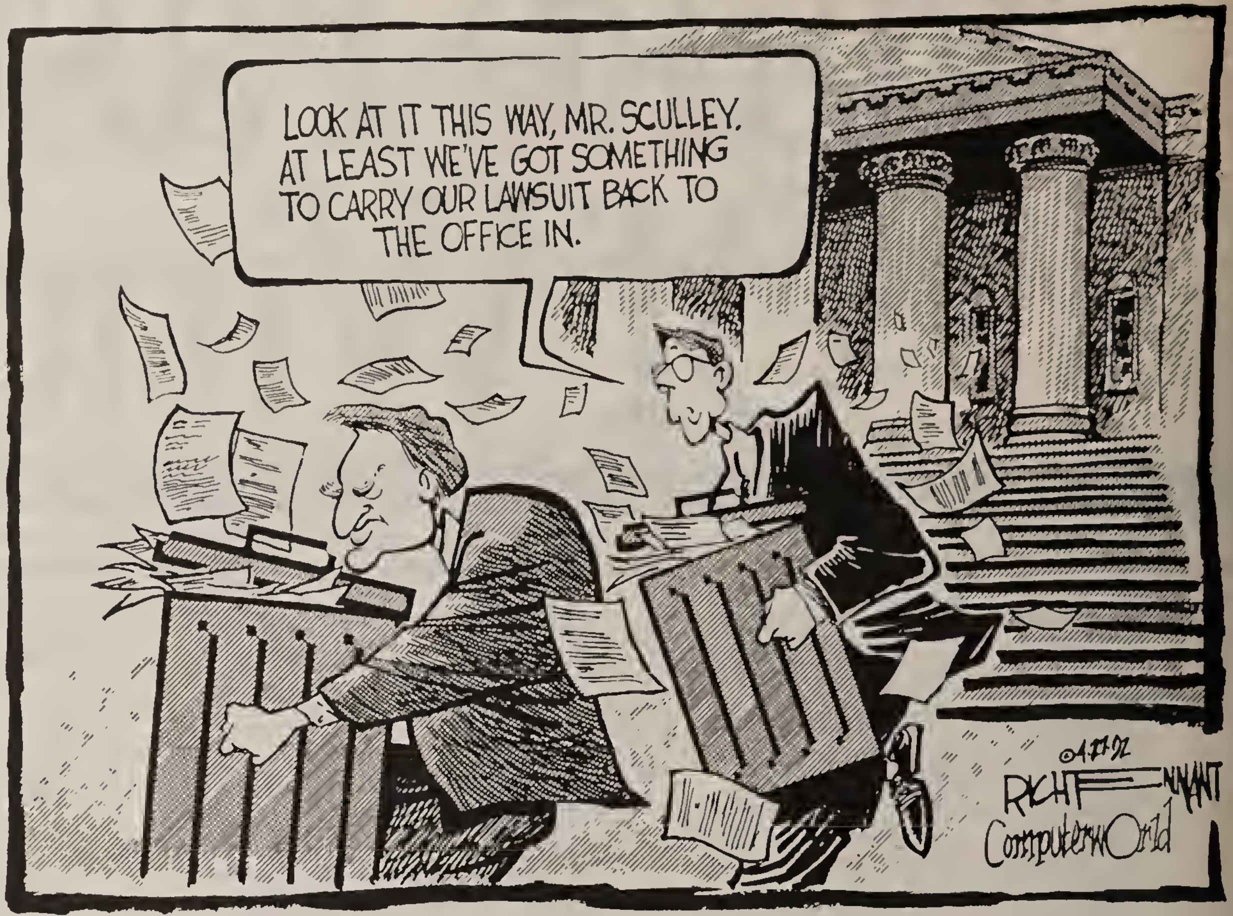
Even the Society of Information Management, which historically has shunned controversy, is studying the broad issue of vendor pricing policies. We hope society members will take heart and some courage from the progress made by users pressuring vendors for a fairer shake.

Once users get accustomed to this feeling of power, they might consider other fish awaiting the fair-shake frying pan. We heard, for example, that one group of IS managers has begun discussions aimed at gaining more favorable licensing agreements from the big PC software vendors — with Microsoft, by virtue of its size, leading the list of targets.

Whatever the outcome of these and other efforts, a combination of lean economic times, aggressive downsizing and mainframe-averse budgets have conspired to create a user movement. How vendors respond to it will dictate the terms of their survival in this very dynamic decade.

Bill Laberis

Bill Laberis, *Editor in chief*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Computerworld

LETTERS TO THE EDITOR

Replacing U.S. programmers with offshore coders ineffective

I just finished reading "Kiss U.S. coders good-bye" [CW, April 6]. Once again, "we are bad, they are better" is touted by the theorists. Once again, our "gurus" are spouting easy solutions to our problems, as they have been for years.

I have been in the information systems environment for more than 28 years, with six years in the offshore programming arena. Americans developed the software industry as it is today. We didn't do it "sitting on our cans"; we did it days, nights and weekends. We did it by dreaming up business solutions and never quitting until they were developed.

I suggest that during travels to foreign sites one look at the software packages in use: Most are American-developed.

I do not believe systems can be created effectively using analysts in the U.S. and coders offshore. The logistics, language barriers and cultural differences pose too many problems. Specifications must be overly detailed. If analysts must spend an excessive amount of time developing specifications, they cannot effectively do the job of analysis. I will say that system prototypes can be developed offshore, but the final product must be completed on site.

Creativity and knowledge cannot be replaced by sheer numbers; they are developed from within.

James Rotter
President
DBMS Software Services
Dickinson, Texas

Management drives coding offshore

When I first read Edward Yourdon's article, "Kiss U.S. coders good-bye," my first reaction was analogous to what one might expect from a United Auto Workers member with each new plant closing.

I am tired of having my compensation level compared with that of my professional peers in Third World nations. I would be quite content to work for $180 a month if the cost of living in America were comparable to that of living in the Third World. I'm inclined to assume that Yourdon would not appreciate such a decline in America's standard of living.

I would like to repeat Peter Drucker's observation that American workers (including programmers) are responsible for only 15% of the problems in any corporate environment. The balance of the problems stem from management. When management stops using words like "quick and dirty" or "nose to the wall" to describe development projects; when it learns how to develop a long-term business plan as opposed to its single-minded devotion to the quarterly financial statement; and when it learns to communicate those plans to IS (used as a strategic resource); then, and only then, will the American programmer be allowed to produce systems that Yourdon deems acceptable.

William R. Rouzer
Systems analyst/programmer
Chula Vista, Calif.

Foreign programmer didn't cut it

Regarding Edward Yourdon's anti-American piece, "Kiss U.S. coders good-bye": Ed, buddy, are you sure your last name is not Rivera, as in Geraldo? Maybe you got the idea for this article while attempting to unearth the alleged hiding place of E. F. Cobb's original notes on structured programming.

A project I worked on last year with some very competent IBM personnel included a non-American programmer. After waiting three days for this man to write one simple program, people started asking questions. It seems this man was one of many people whom IBM brought across the Big Pond to "sharpen" their AS/400 coding skills. However, you cannot sharpen that which does not have an edge. Quite simply, this man could not program a DO-WHILE loop if his career depended on it.

Will American business cave in to this bottom line, even if it means displacing more American workers who deserve jobs? I say American business is for American workers. People should ponder that when they hear the words "free trade."

J. Benedetti
Interlink Technologies, Inc.
Dallas, Texas

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Wake up: The Cold War is over

JERRY BERMAN, JOHN GILMORE
and MITCHELL KAPOR

CRYPTOGRAPHY

We need a robust public debate over our government's continuing heavy-handed efforts to control commercially developed cryptography.

Throughout the Cold War era, the Defense Department and State Department and the National Security Agency (NSA) have used any and all means, including threats of prosecution, control over research and denial of export licenses, to prevent advanced secret coding capabilities from getting into the hands of our adversaries.

Now the Cold War is over, but the NSA is continuing those practices, blocking commercial efforts to enhance the security and privacy of business, financial and personal communications in an era of computer crime, sophisticated surveillance technologies and industrial espionage.

Mass market effect

Although the NSA does not interfere with the domestic distribution of encryption packages, its licensing stranglehold over foreign distribution has effectively discouraged the adoption of powerful encryption capabilities in mass market software. Domestic firms have been unable to sell competitive security and privacy products in international markets. More importantly, because the cost of producing two different products is often prohibitive, NSA policy encourages firms to produce a single product for both domestic and worldwide use, which results in minimal privacy and security for users both here and abroad.

While we all recognize that the NSA has legitimate national security concerns, its policy is seriously flawed. Foreign countries or entities that want to obtain advanced encryption technology can purchase it through intermediaries in the U.S. or from companies in a host of foreign countries that are not subject to U.S. export restrictions. There is a big, big hole in the national security dike. But, taking a page out of *The Emperor's New Clothes*, the NSA opts to act as if the process works by continuing to block exports.

In frustration, the Software Publishers Association (SPA), representing Microsoft, Lotus and others, recently persuaded Rep. Mel Levine (D-Calif.) to propose an amendment to the Export Administration Act to transfer mass market software controls to the Commerce Department.

Although a presidential veto of such legislation was a virtual certainty, the ploy did bring the NSA to the bargaining table. And, after much back and forth debate, the SPA did get the NSA to agree "in principle" to an expedited export clearance for software that SPA members believe provides more powerful encryption capabilities than previously allowed.

Mixed result

This was not a clear victory. The negotiations were conducted in private, and the agreement specified maximum "key lengths" for encryption algorithms that are much less secure than third-party products commonly available in the U.S., including the 15-year-old U.S. Data Encryption Standard.

We don't wish to fault the SPA for making compromises it believed were necessary to get the NSA to budge. While the negotiations were not public, negotiations with NSA are like that. And while the SPA may have gotten only "half a loaf," we believe it did move the NSA in the right direction. Nevertheless, we must oppose the NSA's preconditions for agreeing to the negotiated package.

The NSA wants the full terms and conditions set forth in a "confidential" letter to Congress, with only a summary published in the "Federal Register." At the same time, the SPA would be authorized to disclose the details to anyone who inquires. In other words, it's no secret, but the NSA wants to continue the ruse. The reason for the secrecy, according to the SPA, is that "most of the world does not know of its [the NSA's] involvement in reviewing software with encryption, and they don't want to broadcast the fact in the 'Federal Register.' "

These preconditions will not do. We cannot agree to them, even if rejecting them means that the NSA will back away from the deal.

The public cannot judge whether the SPA has made progress unless the terms of the agreement are on the record. The public cannot debate the efficacy of current practice if it is shrouded in secrecy. Since the deal is not really secret, everyone needs to stop pretending.

The Computer System Security and Privacy Advisory Board, set up by Congress in the Computer Security Act of 1987, recently called for "a national-level public review of the positive and negative implications of the widespread use of public and private key cryptography."

We concur. We believe that the rest of us need to join with the SPA and convince the NSA, the Congress and the public that the Cryptography Cold War is over. Public disclosure is the only way to foster a robust and honest discussion about what kind of clothes the emperor ought to put on.

The authors are officials and board members of the Electronic Frontier Foundation.

Mimicking human reasoning can be a funny business

H. ZAHAROFF

What will be the major challenge for computer technology in the '90s? In an informal survey of freshman computer science majors at MIT, 50% responded: emulating human reasoning. (The other 50% — his roommate — said it will be deciding, after the craze dies, what to do with 11 billion Nintendos.)

These same weenies agreed that the most promising approach to true artificial intelligence is not standard AI programming, for therein lies too much jargon to memorize and, frankly, too few job opportunities for computer scientists. Rather, the solution lies in the new field of "neural networks."

The original approach to AI viewed the brain essentially as a superpowerful computer (which, basically, it is, except for how it looks on your desk). This approach succeeded in emulating many human capabilities, including sight, speech, movement and traffic jams.

In the 1980s, scientists realized they could better simulate human reasoning if they let the computerized brain, like the human brain, evolve from simpler structures. Neural networks arose from this "bottoms-up" approach to AI, using electronic pathways for dendrites, semiconductor chips for neurons and (best of all, from the point of view of MITers) three to six "trainers" instead of one programmer.

And it works! Already researchers have recreated a simplified human ear and eye on a chip (though no one expects these to replace nachos soon). Even more exciting is the application of this bottoms-up approach to simulate lower life forms, an effort recently dubbed "Artificial Life."

The hotbed of this effort is the Mobile Robot Project at (you guessed it) MIT. Here, left brain types, ignoring the fact that insects already outnumber humans by 11 zillion to one, create electronic bugs to imitate ants, roaches and other arthropods.

Santiago Cohen

In the meantime, other researchers, even more dedicated to artificiality, are devoting their time to creating on-screen simulated ant colonies. The next step can only be designing CAD/CAM programs to manufacture leggy, insectoid robots, whose only function will be to manipulate those ants.

But where does that leave us in terms of developing neural networks that will truly mimic people? Square in the middle of a hot new field called "Artificial Comedy." Rejecting models such as Homo Sapiens (only humans collect sap) and Homo Investiens (only humans "buy short"), today's scientists accept the model of Homo Comediens: Only humans tell jokes.

Once again, MIT is out in front. Its new Mobile Comic Project is said to be working on a neural network humor system called "Leno." So far the comic output has been disappointing, but the system shows promise. It is starting to blame its writers.

Zaharoff lives and writes in Newton, Mass., and practices computer law on the side.

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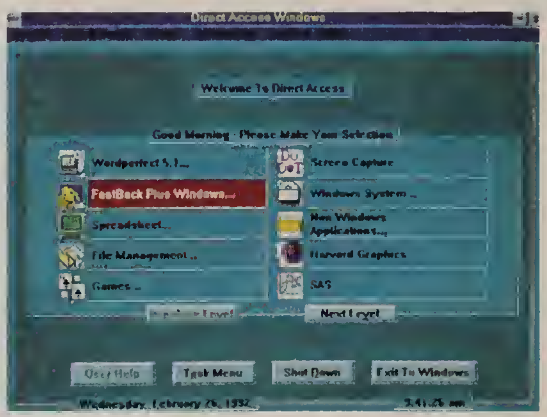

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FIFTH GENERATION SYSTEMS, INC

CA pumps its iron in desktop market

Though not a top contender yet, mainframe giant adds products, resellers in quest for visibility

BY ROSEMARY HAMILTON
CW STAFF

Although Computer Associates International, Inc. says it sold about $100 million in desktop software last year, the company is aware that few folks consider that a big deal in this arena.

Now CA is determined to change that. Armed with a reorganized desktop software business and a string of recently introduced or enhanced applications, CA said it hopes to duplicate its heavyweight status in the mainframe world in the desktop market.

"Over the years, they've acquired and developed technologies for the desktop," said Frank Michnoff, a program director at Meta Group, Inc. "Hidden within that huge company is a large PC software company. But would I deem it a big success? No."

Michnoff and other analysts said CA will have a tough road ahead, primarily because of the cutthroat competition in the desktop market. While CA has more than a dozen desktop applications selling through retail channels today, as well as several others it sells through direct sales, it lacks the critical "mind share" of users, analysts said.

No shining star

One problem is its lack of a breakaway product, like 1-2-3 from Lotus Development Corp., which would give it the name recognition among desktop software buyers that each of the major microcomputer software companies has, analysts added. Although it has a product offering in every key category, none has emerged as a so-called killer application. Its products include CA-Supercalc spreadsheet, CA-Textor word processor, CA-dBfast database and CA-SuperProject project management.

In recent surveys on desktop software purchasing plans, CA shows up with less than 5% share in key areas such as spreadsheets, according to Computer Intelligence's PC Market Monitor.

"I know they have stuff out there, but I can't think of anything that relates them to being among the top [suppliers]," said Robert Hecht, vice president of investment systems at Prudential Investment Corp., one of Prudential Life Insurance Co.'s business sectors.

Company officials said they are aware of the perception that CA is "a mainframe company," but they are working to change that. Sanjay Kumar, the company's senior vice president in charge of planning, said CA shifted gears about a year ago when it moved its microcomputer software headquarters from San Jose, Calif., to CA's New York home base. He described the last year as a time for "essentially building a microcomputer software company."

CA has recruited 4,000 dealers, including retailers and resellers, and is making a bigger advertising push than in previous years, he said.

"We've been [selling software] in retail stores for many, many years," Kumar said. "But we didn't do as good a job as we could have. Micro software didn't get a lot of attention [from CA] through the 1980s. We are doing a number of things to change that."

Needs more limelight

Within its desktop customer base are some satisfied users who say CA just needs to make itself more visible. "I agree with some of the analysts who say CA doesn't have a major presence in the desktop environment, and that's something they should work on," said Pat Adkisson, information services manager at Nordstrom, Inc., the Seattle-based retailer. "The product we have meets our needs right now." Nordstrom was an early user of CA's workgroup software, CA-UpToDate.

The Northeast Utilities Service Co., a division of Northeast Utilities in Berlin, Conn., is devoted to Supercalc, even though other divisions in the company are using Lotus' 1-2-3.

"As time passed, CA kept updating the product," said Thomas George, an accounting systems analyst at the utility. "We have an installed base, people used to using it over the years. To switch now would be very difficult."

One analyst suggested that CA should acquire a big name in desktop software to give it a jump start. "If CA was really serious about getting away from its mainframe roots, it should go out and buy someone interesting, someone with a new technology feel and of significant size," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Simplifying desktop publishing

BY CAROL HILDEBRAND
CW STAFF

WAUKESHA, Wis. — Waukesha Engine Division's bright-orange machines kick into life when the power goes down at such urban meccas as the World Trade Center in New York and Boston's John Hancock building. But the company needed some high-tech help when it came time to jump-start its technical publications process.

Waukesha, an operating entity of Dresser Industries, Inc., has been working out of this city since 1906, manufacturing a full line of heavy-duty natural gas and diesel engines. Big enough to fill the average suburban living room, each engine has as much as 4,800 horsepower. The piston from a typical Waukesha offering would be more than 11 inches across.

But with the giant engines come giant documentation requirements, with some service and repair manuals running more than 500 pages. The firm was producing these manuals, along with accompanying parts catalogs, operations manuals, marketing bulletins and price books, by using an amalgam of six desktop publishing packages, an unwieldy process at best.

"We had to go through four to six different software packages to make one simple change to one paragraph sometimes," said Deb Johannes, manager of tech-

Continued on page 34

ON SITE

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Laptops lack specialized software

BY MICHAEL FITZGERALD
CW STAFF

Despite the difference in the nature of desktops and portables, very little software has been built to run specifically on portables — except for some communications-oriented packages.

Analysts point out the commonsense reason why: People use portables when they find themselves away from their desktops and they want to effectively take their desks with them. In short, portables get used because they run the same software that resides in a desktop machine.

"The main reason portables have taken off is because in that little package, all the functions and features of a full desktop have been crammed in," said William F. Ablondi Jr., vice president of BIS Strategic Decisions.

Small software market

In cases where there is laptop-specific software, much of it is actually based on variants of mainframe-based applications that corporations use to track sales and marketing data. Laptop-oriented software is a small market and may continue to be so: It may be that users will not want software on their portables if it means sacrificing compatibility with desktop environments.

While specialized software for laptops exists, the market remains an area primarily for utilities. By no means have products — such as spreadsheets, word-processors and databases — been modified or optimized for the environment to any great degree.

"Some products, like LetterPerfect, a scaled-down version of WordPerfect, aren't laptop-specific but tend to fall into those hands," said Jeremiah Caron, an analyst at Faulkner Information Services, Inc. in Pennsauken, N.J. "Most people use the same software in desktops and laptops. That's the whole idea behind the current generation of notebooks."

Caron added that he thinks "the market is diminishing specifically for laptop use" as notebooks add power and storage space and move closer to having the functionality of a desktop system.

Communications packages, special cursor enlargers and battery managers have dominated the product list of laptop-specific off-the-shelf applications. Probably the best-known package is Traveling Software, Inc.'s LapLink, which lets laptop users trade files between their laptop and a desktop without using floppy disks.

Communications wave

Analysts contacted said they believe communications will drive future enhancements in software that will end up with more packages tailored for notebook users.

"Communications-enhanced applications may be really the wave of the laptop software evolution," Ablondi said. "Certainly E-mail is part of that, be it cellular, RF modem, wireless LAN — all that will start to come available in portable systems."

Others see opportunities beyond just communications.

"There isn't any [portable-specific software], and there needs to be," said Andrew M. Seybold, editor and publisher of the industry newsletter, "Outlook on Professional Computing." Seybold said, "I think Windows and all the programs that work with it require too much space and could be optimized for the portable environment."

Analysts said they do not expect to see much software for portables on the market until 1993.

"It's a chicken-and-egg problem: [Software vendors] are spread very thin in terms of working across multiple platforms; they have to recognize that they will have a sufficient audience for their products; and users have to recognize they can demand these things," said Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn.

Fiering said better tools are needed to encourage portable software development.

"What in-house developers need are tools. Outside of the Microsoft memory management API set, which couples with the SL chip, I'm not aware of anything that optimizes development in the portable environment," Fiering said.

Most analysts contacted said specialized software might be spurred by the nascent palmtop market. This market could even drive production of products such as word processors and spreadsheets.

So far, though, vendors who have developed software for this market have emphasized that the software runs the same on the desktop or the palmtop. However, the Hewlett-Packard Co. 95LX, jointly made with Lotus Development Corp., may represent the first in a wave of new products. A coming version of Geoworks, Inc.'s Ensemble, slimmed down for the portable environment, could also take off.

"Laptops will lag behind [desktops] in terms of memory capacity," said Matthew Cain, an analyst at Meta Group, Inc. in Westport, Conn. "So there'll be demand for GUI packages that consume less memory."

COMMENTARY

Jessie Berst

Is WOSA worthwhile?

If you follow Windows, then you've found yourself in Acronym Purgatory recently. For instance, there's MAPI (Messaging Applications Programming Interface), a standard way to access E-mail services, and there's ODBC (Open Database Connectivity), a standard set of database calls.

Microsoft's latest "acronym du jour" is WOSA (Windows Open Services Architecture). This abbreviation, however, is an umbrella concept that unites many of Microsoft's other efforts. WOSA is a Microsoft scheme to have Windows arbitrate between applications and back-end services.

For instance, an application that needs E-mail will write to a single E-mail API. The application won't have to worry which E-mail system is plugged in at the back end. In some ways, WOSA is similar to the way Windows insulates programmers from screen and printer issues.

I understand why some users are concerned about WOSA. As Microsoft continues to gain in stature, it's hard not to be nervous about all that power in one place. Nobody wants to be vulnerable to a single vendor.

On the other hand, I see no signs that Microsoft has abused WOSA so far. Clearly, WOSA-style plug-and-play modularity can only help IS professionals. It will take years longer to build enterprisewide solutions if we have to support each back-end service individually and separately.

My advice, then, is to support WOSA but also to support WPMA — a developer's organization that espouses open systems and vendor neutrality — and other user organizations that will monitor it to keep it fair and open. If we can get past the political concerns, WOSA could be an important bridge to the enterprisewide systems of the future.

User independence

In theory, WOSA will make users less dependent on vendors. For instance, they'll be able to switch to a different database or work with multiple E-mail engines without rewriting all their applications.

Most of the corporate developers with whom I have spoken favor the WOSA idea. For example, James Lisiak, a systems analyst at Chevron Information Technology Co., says, "I think it's important. If we can have an API layer to insulate us, that can only be a positive thing."

Lisiak recently helped build a Windows front end for Chevron's global E-mail system.

Despite the good response to the theory behind WOSA, the initiative isn't a guaranteed success. Some corporate developers question whether a generic standard can ever be as robust as products that have been fine-tuned for specific back-end services. "There may be some limitations, but it has to start somewhere. If the industry supports WOSA, it will get better," Lisiak says.

Indeed, the political aspects may prove to be more damaging than technology issues. Right now, some of Microsoft's competitors are balking at some of the components that Microsoft is embracing with WOSA. For instance, Lotus, Novell, Borland and Apple had already joined forces on Vendor Independent Messaging (VIM) as an alternative to Microsoft's MAPI.

Ray Hamman, manager of platform development at EDS/Saturn, calls the VIM vs. MAPI debate "business as usual by these guys." Hamman's job is to watch trends and recommend future platforms. "They all sound good on the surface. We have little choice but to wait for the industry to sort it out. Somebody will eventually emerge as the de facto standard," Hamman says.

Other observers fear placing even more influence and power in the hands of Microsoft. "Their process may be open, but the decision is closed," explains Duke Lane, executive director of WPMA. "Microsoft gets input from other companies, but they are still the ones who decide what to leave in and what to leave out. This is not a democracy."

Hamman has mixed opinions on the political issues. "Theoretically, it's best to have these kinds of decisions in the hands of an independent standards body," he says. "On the other hand, we'll get what we need in a much shorter time frame if we have a single company at the helm."

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Multiple ACT versions to be released

BY CHRISTOPHER LINDQUIST
CW STAFF

CAROLLTON, Texas — Contact Software, Inc., based here, is making a bid to broaden the appeal and accessibility of its popular contact management software, ACT.

The package is being introduced in versions for Microsoft Corp.'s Windows, Apple Computer, Inc.'s Macintosh and Hewlett-Packard Co.'s 95LX platforms, in addition to the DOS version.

"They've combined the best of Windows and the best of ACT into their product," said beta tester Mel Boudin, an information systems analyst at a medical manufacturing company in Miami. Boudin said his firm has some 200 sales reps running the DOS version of ACT.

Full of features

ACT for Windows is scheduled for release in May for a retail price of $495. It combines the standard contact management features of ACT, such as contact names, addresses, notes, history files and scheduling, with a new Borland International, Inc. dBase-compatible file format, Dynamic Data Exchange macros for use with several popular Windows packages and full what-you-see-is-what-you-get calendar, report and word processing views, the company said.

ACT for the HP 95LX is currently shipping for a list price of $149. It includes a connection cable and software that allows ACT users to transfer and update data between the 95LX and desktop versions of the package. ACT for the 95LX also includes a Zapcard feature that allows two 95LX users running ACT to exchange electronic business cards via the palmtop's infrared data link.

The Macintosh version of ACT, which will include support for Apple's PowerBook computers, is scheduled to be available in June.

"Memorial Day weekend, 1991. I was home, relaxing, having a good time. Little did I know that back at the office trouble was brewing." Last year, lightning struck the air conditioning at Guinness America, Inc. headquarters. And even though nobody was around, when the building got too hot and the phone system shut down, an AT&T Mega Watch℠ technician spotted the problem immediately. AT&T Mega Watch is an exclusive AT&T MEGACOM® WATS service. Our technicians monitor your phone equipment and T1.5 circuits, spotting trouble before you can, and coordinate repairs. The service gives you one contact for any network *and* equipment problems that may impact your AT&T MEGACOM WATS service.

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HP: More than printers

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. wants to remind users that its desktop peripherals business consists of products other than printers. It recently introduced a tape drive with data compression for personal computers and Apple Computer, Inc.'s Macintosh. The company also unveiled a 3½-in. hard drive for the Macintosh.

Analysts said that although HP's storage products are not as profitable as its laser, inkjet and dot matrix printers, the company is intent on offering a full range of desktop peripheral products.

The C2225A tape drive is designed for backup use for PCs or PC local-area networks. It ties into PCs only through the HP Storage System, a cabinet housing up to three full-height or seven half-height storage devices for PCs or PC LANs.

The 3½-in. tape drive compresses identical and repetitive data, giving the device a capacity of between 5G and 8G bytes, depending on the type of data.

The compression comes at a premium because HP priced the new drive at $3,595, compared with $2,650 for the 2224B model. The price does not include software required to run the device. HP is offering a choice of two programs, one from Cheyenne Software, Inc. for $1,895 and another from Sytron Corp. for $225.

HP is packaging a Macintosh version of the tape drive, the C2225M with software, priced at $3,795. "Purchasers of Macintoshes expect to receive everything they need at once," said HP product manager Susan Elcox, explaining why HP is bundling software in the Macintosh version but not in the PC version.

Separately, HP priced its new C2454M internal hard drive for the Macintosh at $2,695. The 422M-byte drive can be loaded in the Macintosh Quadra 700, IICI or IICX and supports the SCSI-2 protocol, Elcox said.

Simplifying desktops

CONTINUED FROM PAGE 31

nical communications at the company. "It was a nightmare."

While the packages being used, which included Quark, Inc.'s QuarkXPress and Ventura Software, Inc.'s Ventura Publisher, were "fine for a couple-page newsletter," Johannes said she saw the need to standardize — and on something with a little more industrial strength.

Last year, Johannes and her nine-person department switched everything over to Interleaf V from Interleaf, Inc. "Making the change and getting upper management approval was a major ordeal, but it's been very much worthwhile," she said. For example, that one simple paragraph change can now be done with the click of a mouse. And similar product information is now easily transferrable between manuals.

Step saver

As another example, Johannes cited technical data sheets, which involve both table and chart information, formerly the bailiwick of different pieces of software.

"Today, we just take the information from the engineering department's databases and dump it into Interleaf," Johannes said. "It eliminates about six different steps."

The department runs Interleaf V on a network of personal computers for the writers and Sun Microsystems, Inc. workstations for the illustrators. "We now user Interleaf to design, create templates, input text and illustrations, do layout, merge illustrations and text and output the information onto CD-ROM," Johannes said.

The compact disc/read-only memory (CD-ROM) plays into the next facet of the operation. Waukesha is an early user of Worldview, Interleaf's newly introduced document management system. One hundred fifty distribution sites worldwide run Worldview on low-end 80386-based PCs with about 4M bytes of random-access memory.

The information available encompasses such things as lists of engine serial numbers, bills of materials and sales numbers. Also available are service and repair kits, illustrated parts catalogs and pricing books.

Now, when a customer calls a distributor wanting service, "it is possible with the disk to translate how the engine was built into how it would have to be rebuilt," Johannes said. Worldview replaces an antiquated microfiche/paper-based system that was extremely time-consuming to work on, according to Johannes.

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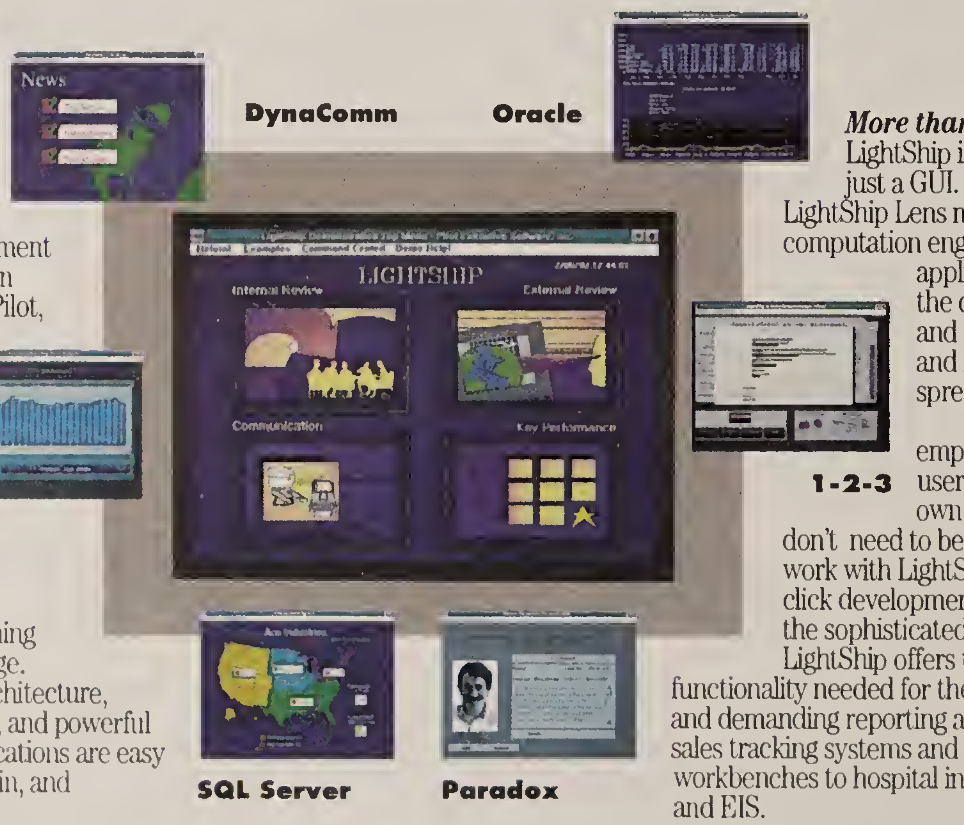

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NEW PRODUCTS

Macintosh products

Meta Software Corp. has started shipping MetaDesign 3.0.

Geared specifically for Apple Computer, Inc. Macintosh systems, MetaDesign 3.0 is for users who build flow charts, system models or organizational charts.

Version 3.0 provides users with industry-standard icons, which can be custom-built with a line tool feature. According to the company, almost any mistake can be fixed with the tool's new multilevel Undo feature, which lets users retrace their steps through the last 25 operations performed.

The product is priced at $250. Upgrades are available for $49.95.

Meta Software
125 Cambridge Park Drive
Cambridge, Mass. 02140
(617) 576 6920

Maxa Corp. has developed Snooper, a diagnostic software tool for the Apple Computer, Inc. Macintosh.

Snooper comprises more than 60 component tests for problems with the hard disk, power supply, system clock, random-access memory and other system components. It also provides benchmarks for system performance.

Pricing is $229 for the Snooper software. A software/hardware solution costs $299.

Maxa
Suite 100
116 Maryland Ave.
Glendale, Calif. 91206
(818) 543-1300

Data storage

International Data Engineering, Inc. has released LG-5 AutoChanger, an optical jukebox device offering 3G bytes of high-capacity storage via a removable magazine that accommodates five International Organization for Standardization-standard 5¼-in. optical discs.

Both personal computer and Apple Computer, Inc. Macintosh users can integrate the AutoChanger with either DOS and Microsoft Corp.'s Windows or the Macintosh operating system.

Pricing is less than $7,000.

International Data Engineering
7727 Washington Ave. S.
Minneapolis, Minn. 55439
(612) 946-4100

Peripherals

Mitsubishi Electronics America, Inc. has introduced Diamond Scan 14 ($740), Diamond Pro VGA ($638) and Diamond Pro 14 ($839) monitors.

The monitors are designed for graphical user interface environments on personal computers and Apple Computer, Inc. Macintoshes.

The products feature compact enclosures, 0.28mm dot pitch, antiglare coated displays, Video Graphics Array signal cable and a tilt/swivel base for simple installation.

Mitsubishi Electronics Information Systems Division
5665 Plaza Drive
Cypress, Calif. 90630
(714) 220-2500

Systems

Packard Bell Electronics, Inc. has recently introduced a multimedia personal computer, the Packard Bell 386CDM-1.

The plug-and-play system includes an internal compact disc/read-only memory (CD-ROM) drive, an integrated digital audio mixer module and an audio system. Other standard features are 4M bytes of random-access memory, a 100M-byte hard drive and an extended Video Graphics Array controller.

Bundled software includes Microsoft Corp.'s Windows with Multimedia Extensions 1.0, Microsoft Works for Windows' Multimedia Edition and several CD-ROM software applications.

Pricing is expected to be less than $2,200, not including a monitor.

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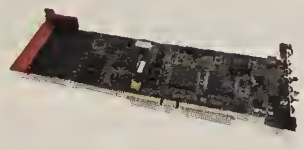
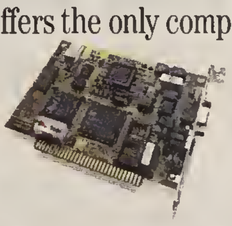

Smart 16/4 MC Ringnode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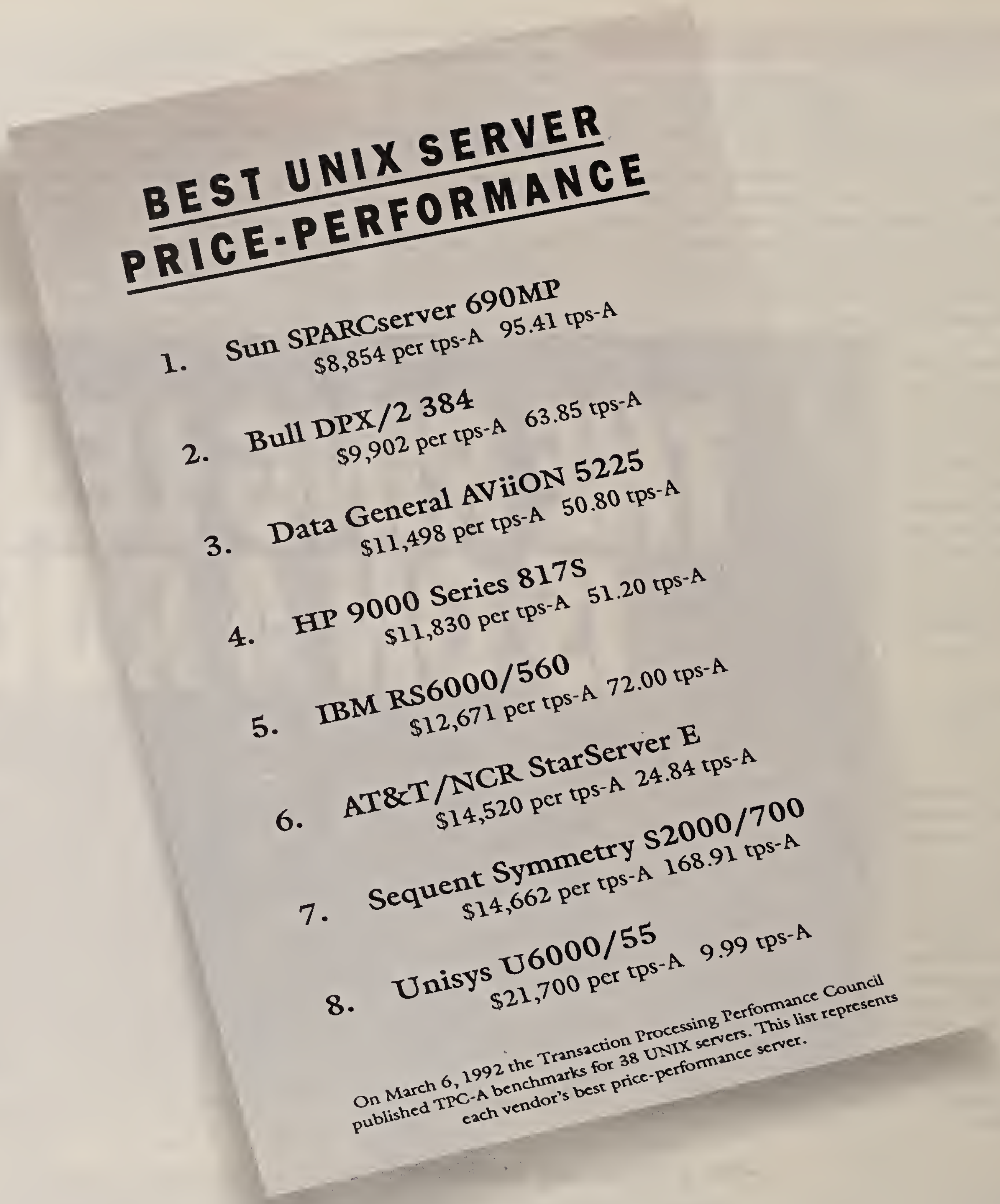

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4. HP 9000 Series 817S
$11,830 per tps-A 51.20 tps-A

5. IBM RS6000/560
$12,671 per tps-A 72.00 tps-A

6. AT&T/NCR StarServer E
$14,520 per tps-A 24.84 tps-A

7. Sequent Symmetry S2000/700
$14,662 per tps-A 168.91 tps-A

8. Unisys U6000/55
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Sun Microsystems
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The SPARCserver 690MP (left) is one of a family of powerful, affordable multiprocessor servers.

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WORKGROUP COMPUTING

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Venerable insurer rides new wave in imaging

BY NELL MARGOLIS
CW STAFF

HARTFORD, Conn. — Connecticut Mutual Life Insurance Co.'s roots go way back — the $1.25 billion firm is the sixth oldest life insurer in the U.S. — but there is no dust on its information systems department. Witness One Image: In its first two years, the $6.5 million imaging project has broken the firm's paper dependency, boosted productivity by some 35% and reinvigorated morale during the past two years, placing the ivy-covered company in the vanguard of an imaging boom analysts predict will hit by mid-decade.

Connecticut Mutual Life Insurance Co.

Hartford, Conn.

- **Challenge:** Smooth out labor-intensive decision processes and inconsistent work processes.
- **Technology:** Filenet imaging systems integrated with IBM PC LAN.
- **Results:** Productivity increased by 35%; paper dependency eliminated.

By then, One Image is slated to be beyond its "Second Wave," marked by the likes of image-driven automated forms, letter generation and client premium management capacity.

The "First Wave" has already made its splash, according to Roger Thibodeau, assistant vice president of applied information technologies. He described the following:

- Paper mail once sorted and delivered manually is now scanned into the system, indexed and electronically dispatched along optimal routes that the software chooses. The manual process took five to seven business days; One Image does it in a matter of hours.
- Phoned-in customer queries that used to trigger manual searches through warehoused information files are now answered by One Image, cutting response time from two or three days to several minutes and replacing telephone tag with same-call service.
- Check services — a facility that automatically withdraws premium payments from the checking accounts of 125,000 customers — used to be handled by employees who searched through 124 four-drawer file cabinets, taking weeks. No

Continued on page 38

Filtering the message deluge

Firms seek to organize the ever greater quantities of mail on their nets

BY JOANIE M. WEXLER
CW STAFF

> "IF YOU COULD have those contents dropped into your mailbox, then filtered, that would be a good application."
>
> PETER ISAKSON
> SMITHKLINE BEECHAM

Many companies are beginning to pile volumes of corporate communications on their messaging networks. A common result is the need for filtering mechanisms to keep users from getting buried under mass quantities of electronic data.

SmithKline Beecham Corp., for example, a Philadelphia-based pharmaceuticals firm putting voice, fax, telex and other traffic on its messaging backbone [CW, April 13], is considering customizing a third-party text-search database as a way to organize mail for users, said Peter Isakson, a senior consultant at the firm's advanced technology group.

SmithKline is beta-testing the database in conjunction with Lotus Development Corp.'s Notes groupware package. Notes is an application development environment rooted in electronic mail-based routing and a shared document database used for managing corporate data flow. Notes can also run under other available applications, explained Chuck Olson, Notes product manager.

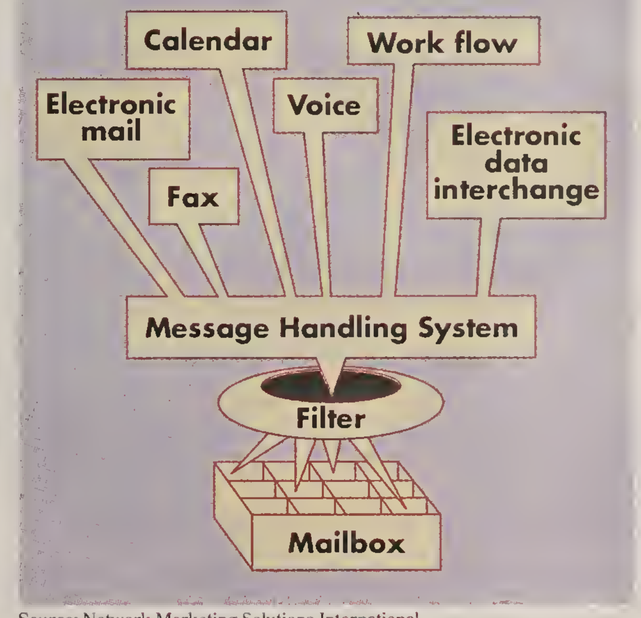
Isakson said SmithKline's test application is being built with Notes to allow users to tap into outside bulletin boards and databases and retrieve timely competitive information that fits the profiles they specify. The application then dumps that information into a Notes database.

"If you could have those contents dropped into your mailbox, then filtered, that would be a good application," Isakson said.

Olson said that, since its inception, Notes has had a scheme for "cleaning up" users' mail and that those capabilities will be enhanced in Notes Version 3, due out in the fourth quarter, with features such as full text retrieval and the ability to build macros that could delete outdated information, for example.

Stuffed mailboxes

As more traffic gets pumped across messaging backbones, users look to electronic filtering mechanisms

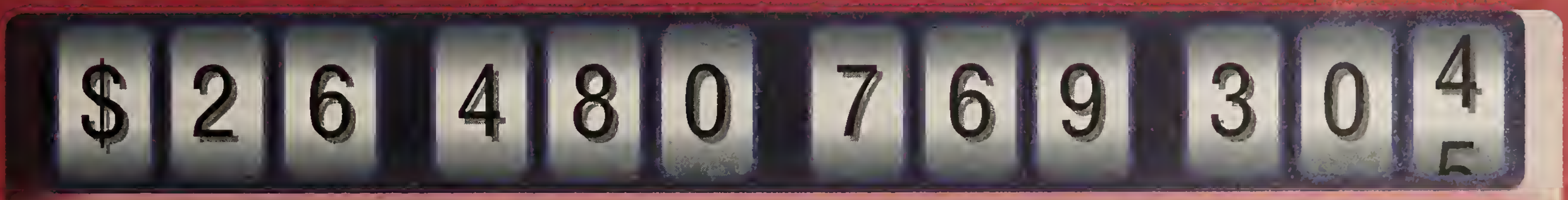


Source: Network Marketing Solutions International

Mail vendor Beyond, Inc. in Cambridge, Mass., offers sophisticated mail foldering, filtering and forwarding capabilities for Novell, Inc./Action Technologies, Inc. Message Handling System-based networks. However, some users said they feel the features, which allow users to set up organized categories of mail in priority order by keyword and to automatically forward or delete certain mail, require too much customization by the end user.

"BeyondMail is *the* filtering package," said Andy Deighton, senior developer at The British Broadcasting Co.'s BBC Radio in London.

Continued on page 40



By the end of this week Computerworld readers will have spent over $26.4 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

Source: IDG Research Services, Fall 1991

Venerable insurer rides imaging wave

CONTINUED FROM PAGE 37

more: During a five-week period last year, Connecticut Mutual IS scanned 300,000 pieces of paper into One Image and wrote work-flow scripts to handle check service tasks.

One Image has already brought productivity increases in excess of the firm's 35% improvement goal. Perhaps even more importantly, Thibodeau says, formerly disparate divisions that once battled over turf are now working for the benefit of the company as a whole. One Image implementation, he said, "ignored hierarchy, turf, rank and serial number — all that mattered was what job needed to be done, and what people and information it took to do it."

Connecticut Mutual built One Image by wedding proprietary FileNet Corp. imaging technology to a 1,000-node IBM Personal System/2 Token Ring LAN. The outcome is what the firm calls its "image-enabled workstation" — PCs packed with FileNet imaging tools and applications, mainframe emulation software, Microsoft Corp. Windows, business applications and a 19-in. monitor.

Workstations access the firm's mainframe — an IBM Enterprise System/9000 — via FileNet servers. A software technique known as masking integrates 26 disparate systems, presenting them to the user as a single image conveyed through a graphical interface.

The system's First Wave was set in motion when a series of federal regulatory changes in the late 1970s and early 1980s opened new financial markets to insurance companies and triggered a competitive avalanche in the formerly slow-moving market segment. Thibodeau said Connecticut Mutual responded exactly as did many of its rivals: "We spewed out products at an alarming rate." On the other hand, he added, "We had to be very specific and tight when it came to buying technology."

By the mid-1980s, the company faced an unwieldy, inefficient paper glut and inconsistent work processes, labor-intensive ways, drawn-out decision processes and the counterincentive of skilled labor bogged down in mundane tasks.

Going for the cure

Imaging, then beginning to be touted by some vendors and consultants as a quick cure for paper dependency, appeared to be the obvious answer. Rather than rush in, Connecticut Mutual's executive and IS team — guided and supported by Jan Scites, senior vice president and chief administrative officer — stepped back to take a long-range look at how imaging technology might be used to retool the firm's work habits.

Two of the task force's early findings, Thibodeau said, hardened into company resolves. The first: that any imaging initiative leverage, rather than displace, Connecticut Mutual's existing architecture. The second: that all bidders for the imaging deal have at least 30 production sites for Connecticut Mutual to examine and question.

"Vendors cringed," Thibodeau said, and only a handful stepped up to bid. Costa Mesa, Calif.-based FileNet won the contract — although Thibodeau noted that some 50% of the capital investment went into IBM coffers, making the award a de facto split vendor decision.

Team spirit

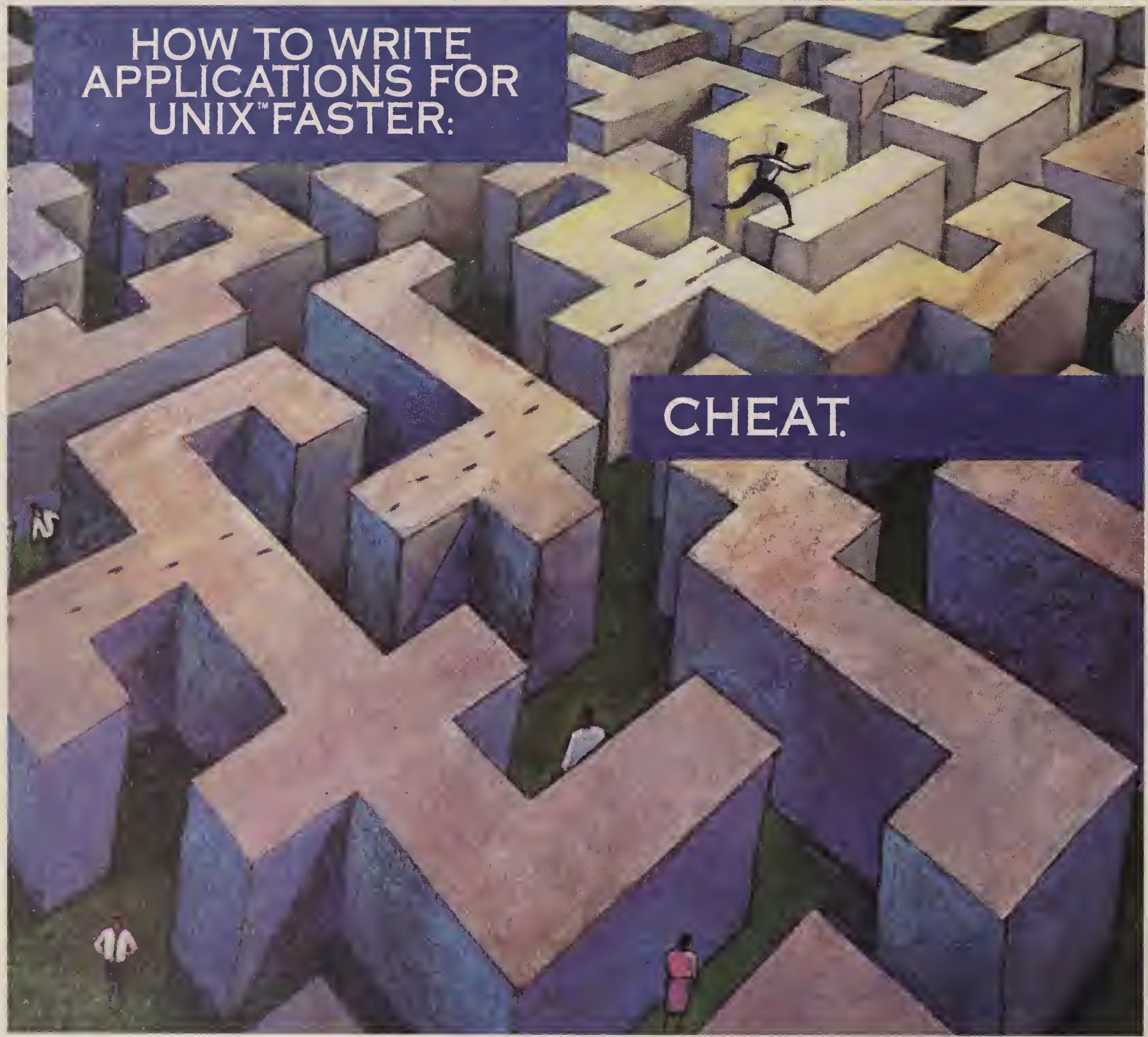
Firms that want to follow Connecticut Mutual's stride into corporate imaging can pick up pointers right at the source: The IS team is setting aside time to give free tutorials to delegations from companies including some of the insurer's biggest competitors. "Prudential visited this week," Assistant Vice President Roger Thibodeau said recently. Philadelphia-based Standard Reliance and Boston-based John Hancock Mutual Life Insurance Co. have dropped by Hartford to hear more about One Image, as has French insurer Alliance.

Visitors get a guided tour through the system's physical setup and a chance to quiz end users on what they are doing.

By helping its rivals leverage the work-flow reorientation it has accomplished through One Image, he noted, Connecticut Mutual stands to create a stabler, more customer-oriented insurance community that in turn will spell better times ahead for all its constituents. And Connecticut Mutual is convinced that it can share its One Image goodies without giving away the store.

"We don't mind letting our competitors in on our secrets because there's no way they can implement something like this without the particular organizational skills we brought to it," Thibodeau said.

NELL MARGOLIS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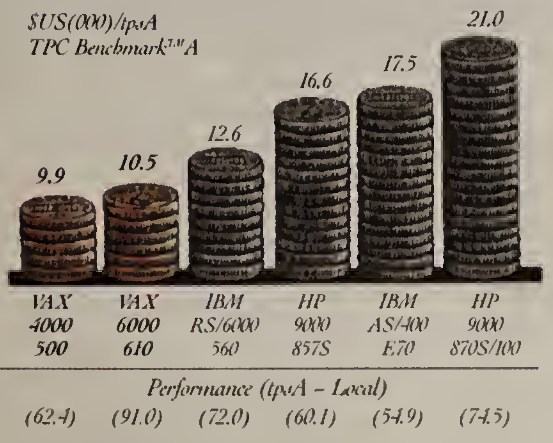

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Microdyne to ship NetWare servers

BY JIM NASH
CW STAFF

ALEXANDRIA, Va. — There was a familiar ring to Microdyne Corp.'s new communications servers announced this month.

Just like the original file servers of the 1980s, Microdyne's two new boxes — an access server and an asynchronous communications server — are hardware/software combinations. Now that the networking industry has been thoroughly convinced of the benefits of buying servers on a component-by-component basis, vendors may be turning full circle to offer turnkey products.

Microdyne, maker of networking hardware, began shipping its NetWare Access Server in recent weeks and plans to ship its NetWare Synchronous Communications Server by the end of this month. Both machines come bristling with Novell, Inc.'s NetWare server software and also hold internal modems, 3½-in. disk drives and Ethernet or Token Ring adapter cards.

Novell licenses its server software to Microdyne, said Gerry Machi, vice president and general manager of Novell's new systems group in Sunnyvale, Calif. He said installing the servers consists of plugging them into both the network and an outside phone line.

Network managers commended Microdyne. The Microdyne access server compares favorably with a version assembled from NetWare's Access Server software, a personal computer clone and generic adapters, said Bill Scharlach, communications analyst at the *Journal of Commerce* in Phillipsburg, N.J.

Because the essential software is the same, he said, performance is the same for each system. The cost is a little higher than the custom-assembled version, but Scharlach said the convenience of plug and play, along with Microdyne's commitment to simply replace faulty equipment, makes it worthwhile.

Novell reseller Rich Rieffer, president of Trivalent LAN Concepts, Inc. in Jenison, Mich., said putting together your own asynchronous communications server or access server saves approximately 10% off the $8,995 to $14,695 price tag each Microdyne product sports.

NOW THAT THE industry has been convinced of the benefits of buying servers on a component-by-component basis, vendors may begin to offer turnkey products.

Scharlach, Rieffer and other communications server users noted the distinctly retro feel to buying networking software bundled into hardware. But, they said, because the software can be purchased separately, the stigma of buying proprietary goods is gone.

"The flexibility to buy [the software] on hardware or not is good," said Mike Johnson, corporate director of information systems and telecommunications at Turner Broadcasting System, Inc. in Atlanta.

An all-in-one approach would be most attractive to networking neophytes, said Ken Thurber, president of the Minneapolis consultancy Architecture Technology Corp. "This is just relative positioning," he said. "The spark a [network] manager has differs." For those who want networks connected through a communications server but do not want to get their hands dirty, Microdyne's product fits the bill, according to Thurber.

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Filtering the message deluge

CONTINUED FROM PAGE 37

"But most of our users will not be writing scripts and rules [required by BeyondMail]. We want to hide that from them."

BBC Radio uses Raleigh, N.C.-based Da Vinci Systems Corp.'s eMail for electronic mail intercommunications between applications without a human interface, Deighton said. For example, the public broadcasting giant has developed an application where a person in charge of program scheduling can leave it to the system to notify all those involved by E-mail, fax or some other method when there has been a scheduling change.

Deighton describes Da Vinci eMail as a "halfway house: powerful enough to be high-end, but simple enough for the novice user." Da Vinci, he explained, allows users to prioritize mail into 12 hierarchical folders while only actually storing one full copy to save disk space.

Microsoft Corp.'s MS-Mail 3.0, due out this quarter, will include a "message finder" feature, a spokeswoman said. That feature will allow users to search text by parameters such as subject, word or sender and create a dynamic filter.

IDC
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White Paper

OPEN SYSTEMS FROM AN END-USER PERSPECTIVE

Working Together to Work Together

U.S. Canoe and Kayak Team
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Introduction

If Hollywood ever made a movie about Open Systems, it would begin with a long distance shot of a seemingly impregnable fortress gouged into the jagged precipice of a mighty mountain. During the course of the movie, a host of invaders would repeatedly assault the fortress, bringing to bear their most formidable weapons. But each attack would be repelled.

Eventually, through the determined application of will power and technology, the tide would turn, and the great battle of Open Systems would end with victory for the conquering forces.

The real battle to achieve Open Systems may be less dramatic, but it is a battle nonetheless. Users must lead the charge by taking control of their technology futures and tying them closely to the business objectives of their organizations.

The weapons at their disposal include a widening body of standards and technology. The proliferation of standards brings with it more choices for users, who must aggressively make them and implement the results. Help in this regard is available through the many standards-related organizations that have sprung up.

The latest wave of technology can also be an ally to users. The emerging Software and Networking Infrastructure is an example. It offers a methodology for integrating the disparate islands of technology created in the wake of corporate confusion over technology acquisition during the past 20 years.

Three other significant components that are critical to the realization of open systems will also come into play. Standards-based products/technology, the open development infrastructure and management directive are all closely associated with the effort to coordinate technology and business needs.

The open systems battle rages on many fronts. It will be won by the most aggressive, resourceful combatants.

This White Paper was written independently of the *Computerworld* editorial department by John Morrell, Senior Research Analyst, and David Smith, Director, Systems & Software Research, at International Data Corporation. For more information on the content of this White Paper, or for information on International Data Corporation, please call 508-872-8200.
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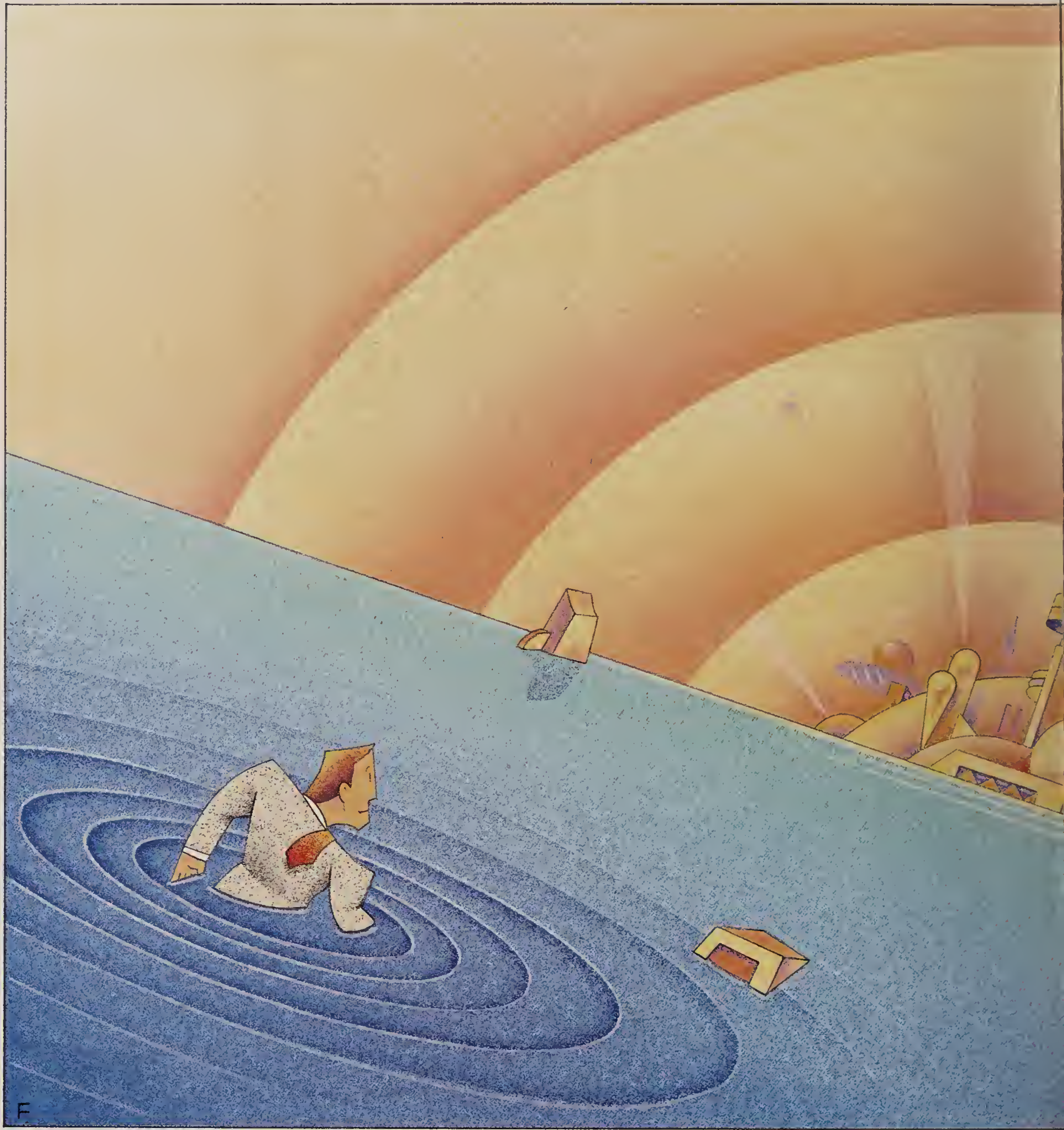
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OPEN SYSTEMS FROM AN END-USER PERSPECTIVE

OPEN SYSTEMS. THE NIRVANA OF THE COMPUTING WORLD; THE GREAT ENABLER OF FUTURE SYSTEMS. ■ TO SOME IT MEANS THE ABILITY TO DRIVE VENDORS TO THE LOWEST PRICES POSSIBLE. TO OTHERS IT MEANS THE ABILITY TO SEAMLESSLY INTEGRATE INFORMATION SYSTEMS, DATA AND APPLICATIONS, ANYWHERE. THE FACT OF THE MATTER IS, NO ONE HAS A DEFINITION THAT EVERYBODY AGREES ON. ■ THERE IS AGREEMENT, HOWEVER, THAT CREATING OPEN SYSTEMS, NO MATTER HOW IT IS DEFINED, WILL REQUIRE A GREAT DEAL OF EFFORT FROM BOTH USERS AND VENDORS. THE POTENTIAL IS GREAT; OPEN SYSTEMS CAN REMOVE THE OBSTACLES TO SYSTEMS DEVELOPMENT AND DELIVER THE ULTIMATE PROMISE OF COMPUTER TECHNOLOGY: EASY ACCESS TO A WEALTH OF INFORMATION. ■ ON THE USER SIDE, ORGANIZATIONS MUST TAKE CONTROL OF THE TECHNOLOGY ACQUISITION PROCESS AND MAKE SURE NEW PRODUCTS ARE SUCCESSFULLY IMPLEMENTED. THIS WILL REQUIRE THAT MANAGEMENT TAKE A LONG-TERM

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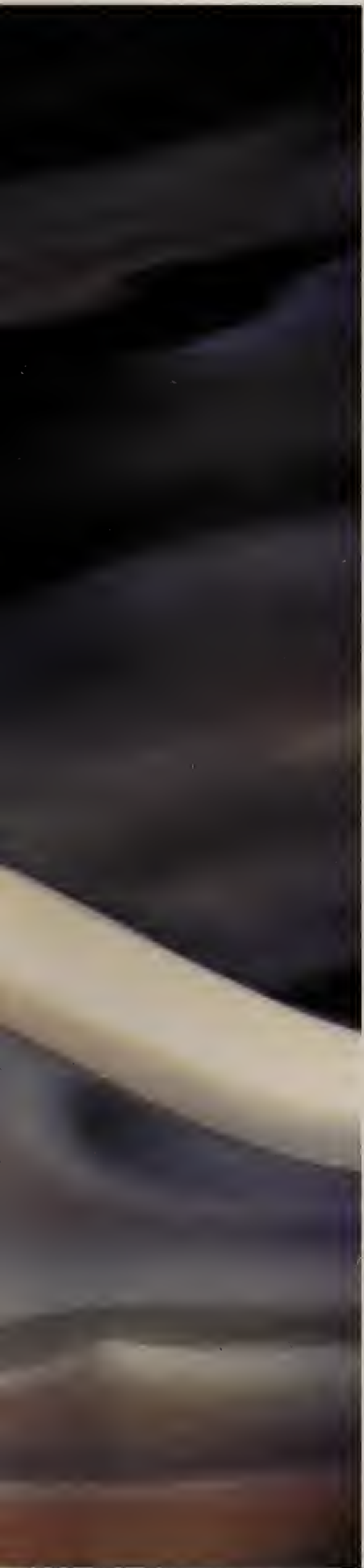

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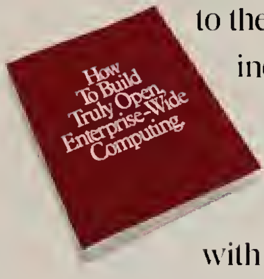

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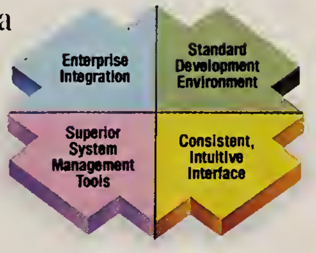

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view of both the technology and business objectives of their organizations.

From the vendor perspective, it is difficult to justify the investment necessary to engineer, market and deliver open systems technology components. Vendors need to see that users have stopped buying closed products and have started buying open products. The decision to invest in building open systems products is particularly difficult for vendors of closed products.

A BRIEF HISTORICAL PERSPECTIVE

IDC believes that information systems have moved essentially through three technology waves, each associated with specific hardware advances: the mainframe, the minicomputer and desktop computing. Each of these technology waves has contributed specific benefits and capabilities that have helped automate business functions.

The mainframe came first, automating corporate-wide functions. Next came the minicomputer, which was cost-effective enough to meet the more specific needs of departments and small-to-medium-sized businesses. The PC revolution advanced personal productivity through spreadsheets and word processing, allowing technology to shift the solutions directly to individuals and away from organizations.

Each of the technology waves was isolated from the others. There was no cohesive way to integrate them. As the hardware and software platforms shifted, new knowledge was required to integrate them. Meanwhile, the software and personnel assets companies required to utilize and manage all of the acquired platforms grew exponentially. The result was islands of automation with no mechanism to unite them and realize their full potential on an enterprise-wide basis.

As each new technology wave brought down the cost of implementation, information technology became individually accessible to more diverse areas within organizations. Empowered with the ability to make their own purchases, individual departments, and then workgroups, acquired more and more technology. Divisions and departments bought minicomputers and allocated staff to develop and maintain proprietary applications. Workgroups followed suit with PC LANs.

This decentralization occurred in many cases without an eye toward potential overall organizational benefits. Without centrally promulgated purchase guidelines, individual groups often invested with blinders on. The result is the mass of incompatible systems, software and networks in glaring evidence at many organizations today.

Even the vendors that encouraged this technological feeding frenzy are now at risk. The mainframe market grows, but only slowly because in many cases users are trapped by their mainframe heritage. The midrange market is flat. Many look to Unix as a midrange savior, but it remains largely a replacement for proprietary systems driven to extinction by the lack of an installed base.

Finally, the desktop market, which includes PCs and workstations, is slowing down to single-digit annual growth. All these markets are slow for two reasons: the functions their technologies could individually automate are exhausted and the rate of investment in them has leveled off.

SOFTWARE AND NETWORKING INFRASTRUCTURE

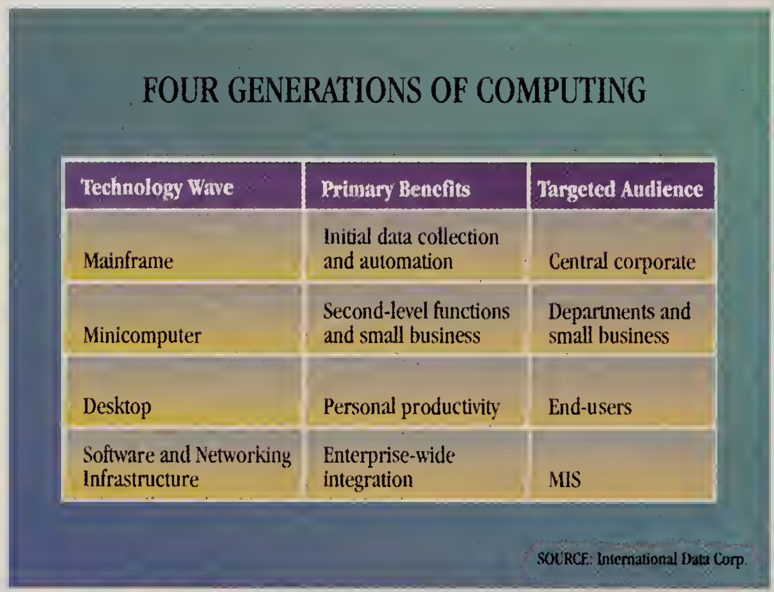
IDC sees a fourth technology wave developing during the 1990s: the Software and Networking Infrastructure. Many companies will invest tremendous resources installing these corporate-wide infrastructures integrating islands of automation and reinstating control of MIS. It will be much easier developing these sprawling Software and Networking Infrastructures in an open systems environment.

Just as the Software and Networking Infrastructure will be facilitated in an open systems environment, the still-emerging client/server computing environment will blossom within Software and Networking Infrastructures. This is because this fourth technology wave will make the cost of creating, developing, and managing a client/server environment acceptable to most organizations.

UNDERSTANDING OPEN SYSTEMS

The concept of open systems is wide-ranging and subject to interpretation. On the technical side, it includes network protocols and Application Program Interfaces (APIs). On the business side, it means unimpeded information access. The varied nature of open systems is attributable to the complexity of the Information Systems (IS) value chain. Users look at open systems from the perspective of their information and workflow environment. Hardware and software vendors consider open systems in terms of the technologies they can supply. Caught in the middle is IS, which has to view open systems in the widest context — from the vantage point of vendors, to users, to management.

In an effort to better define open systems, some equate it with Unix. They rationalize this by saying that Unix offers inexpensive solutions, portable software, interoperable applications and vendor independence. Despite these claims put forth by a small number of Unix purists, Unix is not an open systems panacea. If open systems only imply standards compliance, then many systems are open. However, these "open" systems fail to ensure the long life and usefulness of IT investments that truly open systems will offer.



FOUR GENERATIONS OF COMPUTING

Technology Wave	Primary Benefits	Targeted Audience
Mainframe	Initial data collection and automation	Central corporate
Minicomputer	Second-level functions and small business	Departments and small business
Desktop	Personal productivity	End-users
Software and Networking Infrastructure	Enterprise-wide integration	MIS

SOURCE: International Data Corp.

Each of the first three computer waves was geared toward a particular hardware platform. The fourth wave aims to eliminate this hardware focus and utilize all corporate information technology.

The open systems world must leave room for innovation. If all open systems technology were governed by strict standards, where would the next technology wave come from? The fact is, most users agree that they are not seeking an environment where every component looks the same, but rather one where all their information technology can exist cohesively.

Open systems are built by organizations that rely both on business and technological acumen. Vendors and standards bodies may define open systems in their own ways, but only users know what technology is relevant to their set of problems.

If information technology is to run through the mainstream of organizations, it must be governed by the same kinds of rules that govern people. When a person is hired, certain qualifications must be met and certain guidelines followed. The same should be true for information systems.

IDC believes open systems is a methodology information systems implementors will use to create a flexible environment that will allow business problems to be solved in a manner that benefits the entire organization.

Three interdependent components are required to create a true open systems environment:

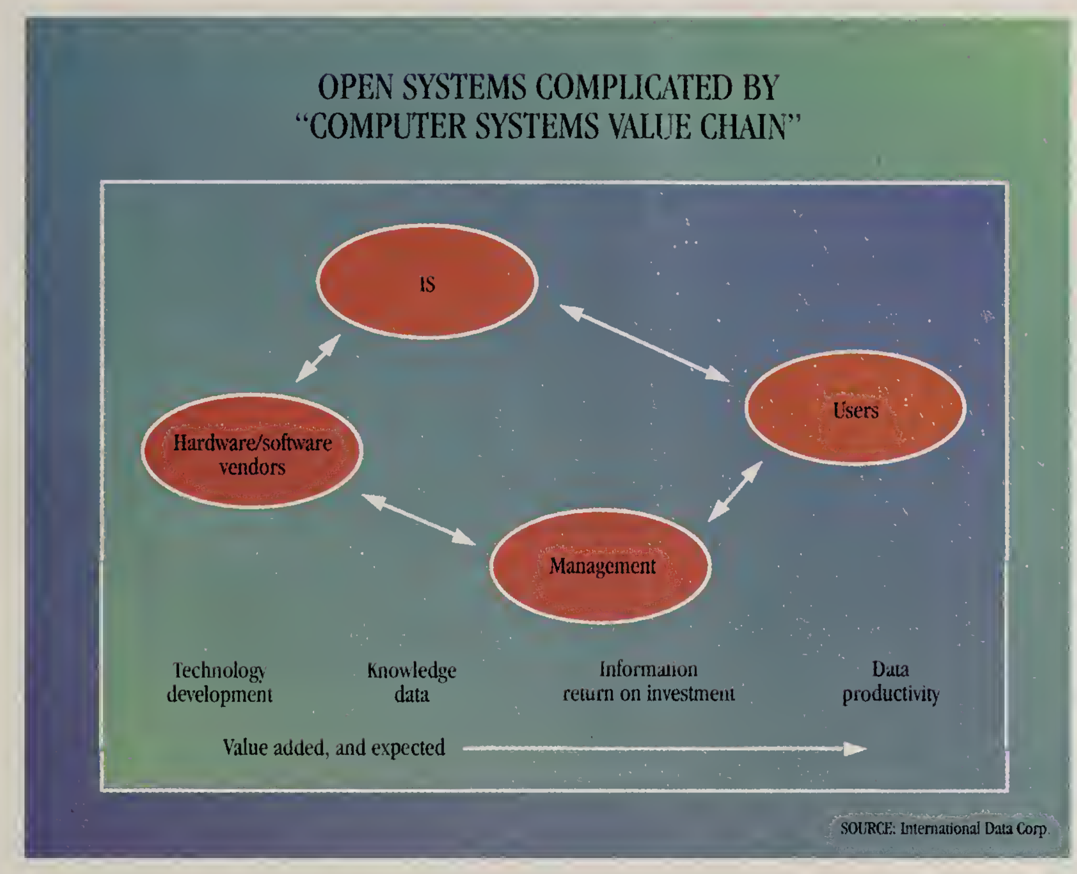
- standards-based products/technology
- open development infrastructure
- management directive.

Standards-Based Products/Technology

This component is the subject of most of the open systems hoopla, even though it is just one part of the story. Standards-based technology provides such features as interoperability and portability.

When most people think "open", they also think "standards". "Proprietary" is another word that is frequently mentioned during conversations about standards. In most cases, it is taken to mean the opposite of open. In reality, the opposite of open is closed, not proprietary, and closed technologies are what lead to dead-end IT investments.

To foster innovation, there will always be, at some level, certain proprietariness in any implementation. The key is to balance the risk of proprietary technology with the level of innovation required to implement an information systems solution. Utilizing standards minimizes the risks of proprietary solutions by limiting exposure to closed-ended products; but the scarcity of standardized technology may also restrict innovation.


OPEN SYSTEMS COMPLICATED BY
"COMPUTER SYSTEMS VALUE CHAIN"
IS
Users
Hardware/software vendors
Management
Technology development
Knowledge data
Information return on investment
Data productivity
Value added, and expected

SOURCE: International Data Corp.

The diverse interpretations of open systems are attributable to the complexity of the computer systems value chain. Vendors, management, users and IS all view the concept in terms of their own needs.

IDC predicts a continual growth of new standards. One result of this process will be an increasing number of APIs linking different products that will in turn provide functionality at different levels.

The standards development process typically takes a "fill-in-the-puzzle" approach. Standards exist at different hardware, operating system, network, and software levels, but still do not provide a complete solution. In some cases, no standard exists and in other cases, multiple standards exist.

Open Development Infrastructure

This component is the key to ensuring the long life and usefulness of each technology implementation. The open development infrastructure is needed to ensure that information technology is implemented in the most effective possible way for the largest possible user audience currently, and in the future.

In a true open systems environment, the application of information technology will incorporate previous technology investments, allowing them to be integrated with their newer counterparts. At the same time, these newer technologies must be open to the technologies that succeed them.

While standards provide the assurance of software and hardware continuity, the open development infrastructure makes sure that these standardized products are properly applied to the IS environment.

In order to maximize the benefits of open technology, the open development infrastructure approach requires discipline. It is very easy to fall into the trap where closed applications lacking portability and interoperability are built upon open systems. For instance, a user could buy a standardized database product compatible with industry-standard Structured Query Language (SQL) capabilities but negate its standardized nature and portability by adding nonstandardized extensions. It is also easy to end up in a situation where incompatible networks spring up throughout an organization because users are upset about being left out of the development process. These ad hoc networks may soothe egos and solve

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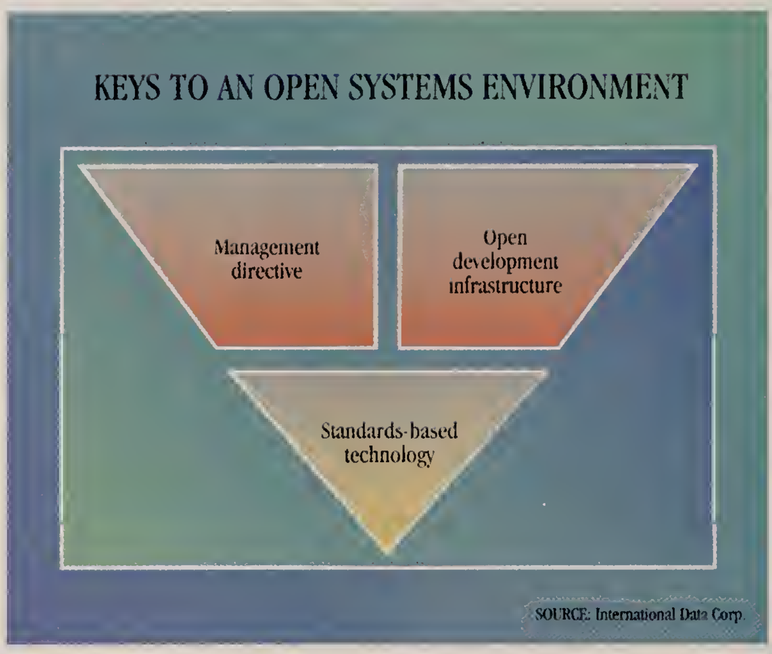
short-term problems, but they will haunt their organizations at some point in the future.

The open development infrastructure should ensure that the needs of all groups are addressed, while solving their problems in a manner consistent with the goals of the organization.


KEYS TO AN OPEN SYSTEMS ENVIRONMENT
Management directive
Open development infrastructure
Standards-based technology
SOURCE: International Data Corp.

IDC's view of the open systems environment emphasizes adherence to technology standards, but is highly dependent on organizational initiatives.

Management Directive

This component is required to make the technology serve the business as opposed to being implemented in a scattershot fashion. Without management directive, islands of automation will continue to exist and information will be used as a weapon by groups with individual purchasing authority, but not for the organization as a whole. Management directive must ensure that products are bought with the greater good of the entire organization in mind. Issues ranging from the content of RFPs, to gathering end-user requirements, to the actual purchase and use of technology must be addressed.

The management directive must result from a consensus of all the groups with a vested interest in the IT infrastructure. This consensus-gathering process becomes increasingly important as companies decentralize their decision making processes.

REALIZING THE BENEFITS OF OPEN SYSTEMS

The benefits of open systems will vary for MIS, management and the end-user.

MIS

The most tangible benefits of open systems will be experienced by MIS. Specifically, these benefits will be found in three general areas. The first includes increased productivity and faster user response. The second is better control of the IT environment. The third is cost control.

Open systems will exponentially increase the productivity of programmers, analysts and staff because of the portability of skills it fosters. In an open systems environment, commonality of development environments and management schema will provide MIS with one set of skills across its entire staff.

The presence of an integrated, open standards architecture means that new applications do not have to be reengineered from the bottom up. This will free MIS personnel to perform other tasks. New application development and user requested changes will thus be handled in a swifter fashion, reducing the lag time experienced by users.

In addition, open systems will bring a greater sense of control to MIS from both technology and management perspectives. The predictability of open, standards-based environments will afford MIS management the ability to allocate resources and manage change in an optimal fashion.

Management

The advantages open systems will offer management are threefold. The first advantage includes less emphasis on technology and more on business. The second is smoother IT investment streams. The third will be a more flexible IT structure that can change with business needs and objectives.

When implemented properly, open systems will return management to a more ideal world where it can apply its skills to the business operations of the company. The idea is to allow managers to simply utilize their IT investments without them having to manage the process of making them all work.

Since systems, software, training and development expenditures within open systems will come in manageable chunks, IT planning will be more accurate. Management will be able to plan IT investments in a smooth, incremental fashion, taking a longer term approach to the return on these investments.

Open systems will also bring with them an environment that is inherently flexible and transportable. As organizations shift roles, or as new divisions are created to tap market opportunities, applications, data, and systems will be able to move with them or be added easily.

The End-User

As stated, the realization of open systems will bring unimpeded access to information.

In the past many end-users resisted the advancement and proliferation of computer technology in the workplace. Although there are many emotional reasons for such resistance, in a clinical sense, it constitutes a failure to seamlessly integrate the technology at hand with the job requirements.

The end-user's job should not have to worsen based on the spread of information technology; it should be enhanced. With open systems, new opportunities will be presented to the end-user, who will be able to perform them without having to understand the technology driving them.

Today, certain dividends are paid to the person who understands how to navigate the network, reach the mainframe and utilize the cryptic report writer to disseminate information from corporate databases. When open systems are implemented, information will be available in a more egalitarian fashion which will allow all users to employ it productively within their organizations. Organizations will be well served if the users accessing this information understand how to link that information with business objectives.

ORGANIZATIONAL ISSUES

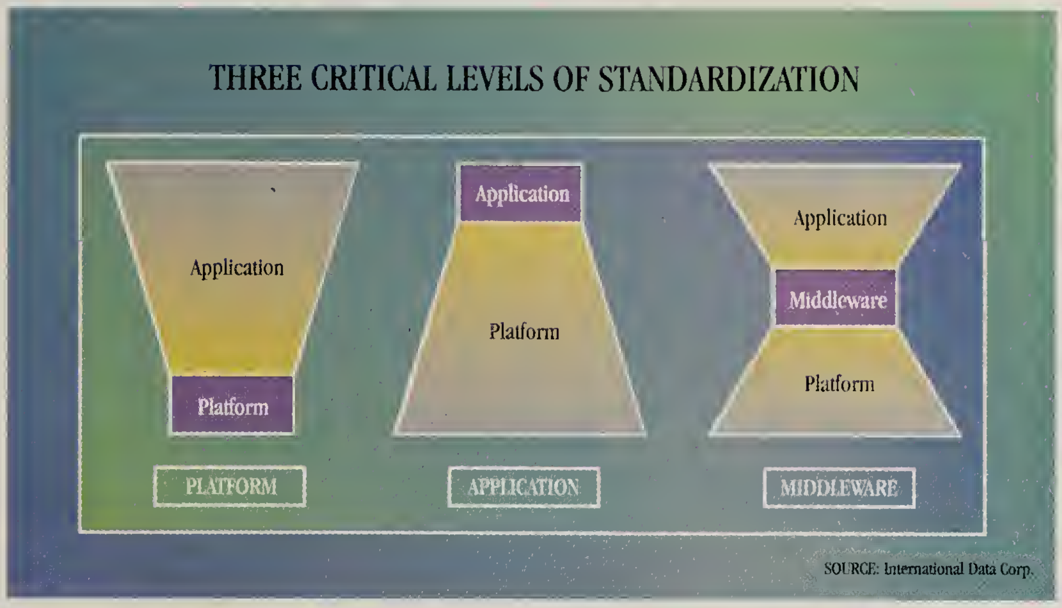
There are many barriers facing the successful adoption and implementation of open systems within an organization. While many are technical, IDC believes many others are organizational. Much work in identifying these organizational barriers has been done by the User Alliance for Open Systems, an arm of the Corporation for Open Systems, International (COS).

One mission of the Alliance is to overcome barriers to the successful implementation of integrated business information system environments. In its "Overcoming Barriers to Open Systems Information Technology — First Official Report," known more informally as "The Barriers Document," the Alliance identifies nine barriers to open systems implementations and formulates action plans to attack each of the barriers.

The Alliance has done an excellent job articulating these nine barriers. They are:

1. The user community lacks a process to identify common requirements for open systems.
2. The user community lacks a vehicle to exert collective leverage to cause vendors to implement common requirements.
3. Resources invested in systems and applications, and the attitude and culture of the work force, make it difficult to evolve to an integrated business information environment.
4. There are insufficient open systems.
5. Current business practices encourage a short-term approach to solving business problems while ignoring long-term integration issues.
6. There is no perceived linkage between the implementation of open systems and accomplishing business missions and objectives.
7. There is a fear of being unable to compete using open systems, causing an unwillingness to change.
8. There is no documented, coherent North American "vision" of broad-based enterprise integration and the role open systems play in achieving that vision.
9. There is no shared vision for developing an open systems process.

Note that with the exception of barrier number 4, the barriers are organizational in nature.



SOURCE: International Data Corp.

Standardization can occur at the platform, application and middleware levels.

Among technical problems that do exist, one of the most intransigent is the issue of updating legacy systems. The considerable investment in these systems is composed of hardware, system software, application software, networks and the less tangible elements, expertise and training.

Users find it difficult to migrate to more cost-effective systems because critical day-to-day business applications must stay up and running. Making matters worse, in many cases, software cannot be rewritten because original source code is either lost or too poorly documented.

STANDARDS TRADE-OFFS

IDC believes that systems are composed of technologies at three distinct levels: standard hardware and software platforms, applications and middleware. Standardization is taking place at each of these levels.

Standard Hardware and Software Platforms

This is the model adopted by the PC market. Standardization has occurred on Intel x86 hardware using MS-DOS and Microsoft Windows 3.0 as the operating environment. This has fueled the availability of large numbers of applications in response to the immense market demand.

The result has been incredible choice in applications but little choice of hardware and operating environment, which has caused a drag on productivity.

Standard Applications

Users who standardize on specific applications generally do so to ensure interoperability between work groups. These users are limited to running their chosen applications on specific hardware and operating environments. Locked in this mode, they are unable to take advantage of competing applications.

Middleware

IDC defines middleware as software that resides between an application and an operating system/platform. In the past, middleware has often consisted of proprietary layers of software.

Today, its most common forms include: information management (databases, repositories, etc.), presentation management (graphical user interfaces, forms management, printing services, etc.), communications (remote procedure calls, messaging, E-mail, document linking services, etc.), management tools (notification, fault detection, recovery coordination, accounting, encryption, authentication, etc.), and software development tools (code generators, debuggers, upper and lower CASE tools, etc.).

With the recent emphasis on open, standards-based technology, middleware is evolving to become more platform-independent and to use standard protocols and interfaces when they are available and mature. IDC expects this trend to continue. It should be noted that middleware is an entity, not a part of applications or platforms.

There are also many examples of middleware that are not based on standards. There are times when it is appropriate to utilize such non-standardized technology. For instance, if proprietary technology solves a business problem and if there is

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THE OPEN ADVANTAGE.

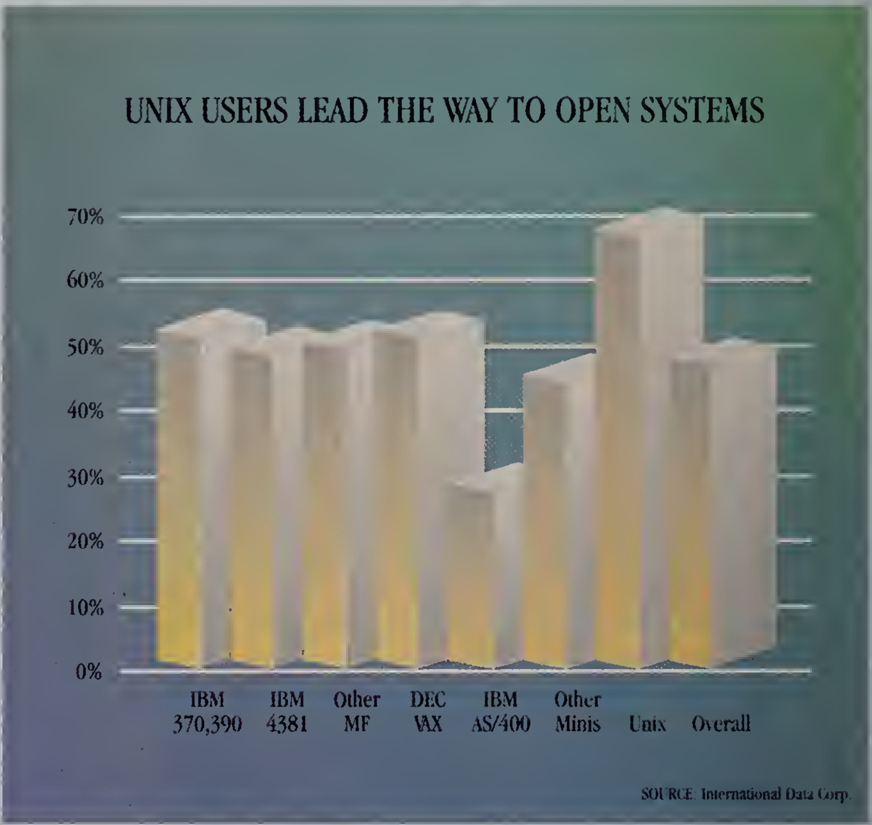
Users Reveal Their Ideas of Open Systems via IDC Study

Much of the debate around open systems is the result of the many different definitions that explain the concept, and the positioning of many products as being "open systems". IDC believes that open systems is not a single, tangible product that one can buy, but instead a set of methodologies by which information systems are put together.

Since every MIS shop has its own unique set of problems, it will solve them with its own information systems structure. Because of this, open systems will be defined by each organization in a method that describes their specific goals and needs, creating a myriad of definitions, none of which are wrong. Yet, no matter how it is defined, users are ratifying the concept of open systems more than ever.

DETERMINING STRATEGIC PLANS

Nowhere is the movement towards open systems more evident than in the results of IDC's 1992 IT Strategy Directions and Spending Patterns survey. The purpose of this survey is to measure on an ongoing basis the strategic issues facing MIS organizations and their plans for acquiring information systems technology. Close to 1,600 mainframe (IBM and other) and midrange (IBM, DEC, Unix and other) systems sites responded to the survey, detailing their plans for IT investment.



SOURCE: International Data Corp.

Almost 70% of Unix users surveyed say their organizations are pursuing an open systems strategy.

One question in the survey is: "Is your organization pursuing an open systems strategy?" The response to this issue shows high levels of interest in open systems. Almost 47% (46.9%) of the total sites surveyed claim to be planning or implementing a strategy for open systems within their organization.

Not surprisingly, Unix midrange system sites were most active with open systems, with 65.6% of the respondents answering "yes" to the question. Interestingly, IBM 370/390, IBM 4381, other mainframe, and DEC VAX/VMS sites also showed remarkable interest in open systems, with each group having close to half of the respondents actively pursuing open systems. Little interest was seen in the IBM AS/400 and System 36/38 base, where only a little over a quarter (27.6%) of the sites claimed to be moving towards open systems.

EXPLAINING THE LACK OF INTEREST

Why do some sites show no interest in open systems? One explanation could be the old adage, "if it ain't broke don't fix it." Some sites currently have their IT structure fully under control, and see no reason to institute change. Their current vendor or set of vendors is providing a steady stream of useful technology enhancements that enables the majority of IT related issues to be solved in a relatively simple manner.

Another explanation could be that some believe open systems is just a pipe dream, and do not perceive any benefits open systems may bring about. A third possible explanation could be that some sites are bogged down with so many problems today (application backlogs, limited staffing, etc.) that the time to investigate or develop an open systems strategy does not exist.

Some of these sites may never need to institute an open systems strategy, while others may just be waiting to see the tangible benefits brought forward in an open forum.

WHAT MEANS TO AN END?

The second interesting question was asked of sites who respond that they are pursuing an open systems strategy: "If you are pursuing open systems, by what means?" The respondents were given four methods to choose from, with multiple responses allowed:

- a standardized operating system
- an enterprise-wide communications system
- common development tools, programming languages and database software
- other.

The methods of implementing open systems are varied among user sites. Of the overall sample, 50% of the sites rate a standardized operating system as the vehicle implementing open systems, while slightly over 40% vote for common tools, languages and databases. Surprisingly, only a little over 23% are implementing open systems via enterprise-wide communications mechanisms.

ANOTHER PERSPECTIVE

However, if you break the sites into three categories, mainframes, proprietary minicomputers, and Unix minicomputer/server sites, the responses take on new meaning. The Unix sites are heavily weighted towards standardized operating systems (70.5%) with some interest in using common tools, languages and databases. The rationale for this is quite obvious: most Unix sites associate the portability and interoperability provided with Unix with open systems.

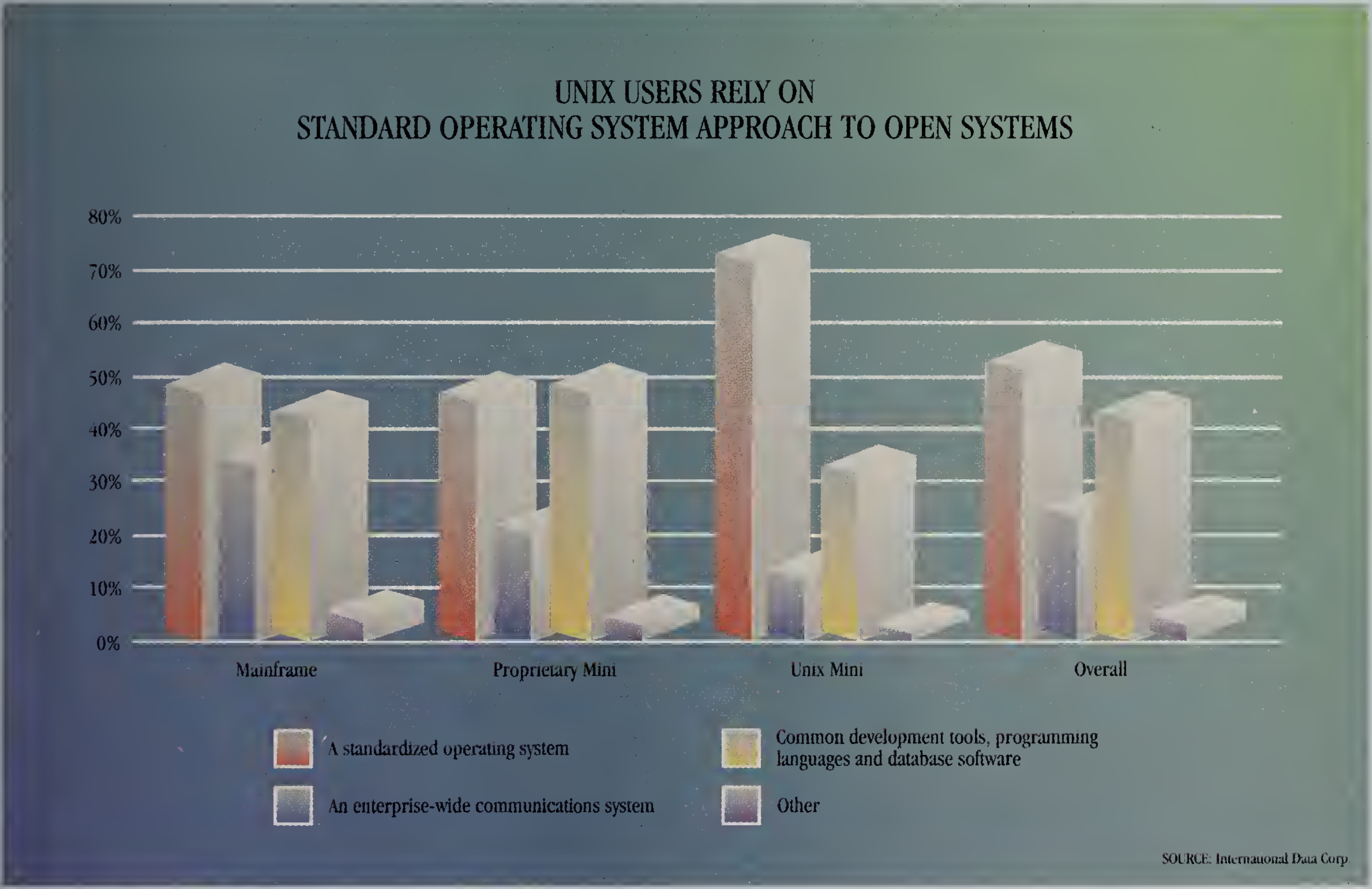
The methods for implementing open systems change radically in the mainframe and proprietary minicomputer sites. While standardized operating systems are still relatively important in the mainframe sites (45.8%), enterprise-wide communications play a much larger role (32.4%), and common tools and software (41.5%) are also rated slightly higher than at Unix sites. Proprietary minicomputer sites similarly see less interest in using standardized operating systems, and have even greater numbers than mainframes using common tools and software (46%). An above average number use enterprise-wide communications (20.3%).

ANALYZING MULTIPLE RESPONSES

A final revealing set of statistics from the responses to this question is the number of multiple responses. Over eighteen percent of the overall sample list more than one of the four methods to implement open systems, with close to one quarter (23.4%) of the mainframe sites giving more than one response. To these sites, open systems means standardizing on multiple components within an architecture to gain the most flexibility and leverage. Obviously, the best solution for them is a mixture of available technologies.

The overall theme brought forth from this set of survey respones is that there is no one technology or method for implementing open systems. Different sets of users are instituting their own policies to ensure the continued life of their IT investments in a mechanism that is unique to their own IT infrastructure.

What do the results of this survey tell us? Although it is easy to rely only on the numbers and ignore their meaning, the best conclusion to draw is that open systems involves users controlling the destiny of their information technology. Users are the ones defining open systems. They do so according to individual needs and will spend their IT budgets according to the policies and infrastructure they have pieced together. Isn't that what open systems is all about?



SOURCE: International Data Corp

Slightly more than 70% of responding Unix users say they are relying on an open systems strategy based on the use of a standard operating system.

no standards-based solution available, the proprietary solution is better than none.

Standard middleware is the model adopted by users who decide to standardize on a particular component or set of components. Users who wish to acquire standardized middleware, such as a specific vendor's database, should make sure they are not trading off software portability for hardware portability. They could end up locked into a software architecture instead of a certain hardware line.

There are alternatives in the standardized middleware model that can minimize this potential pitfall. IDC believes that standardization at the middleware level represents the most flexible model since it offers more choice and, if implemented in a disciplined way, best avoids proprietary solutions.

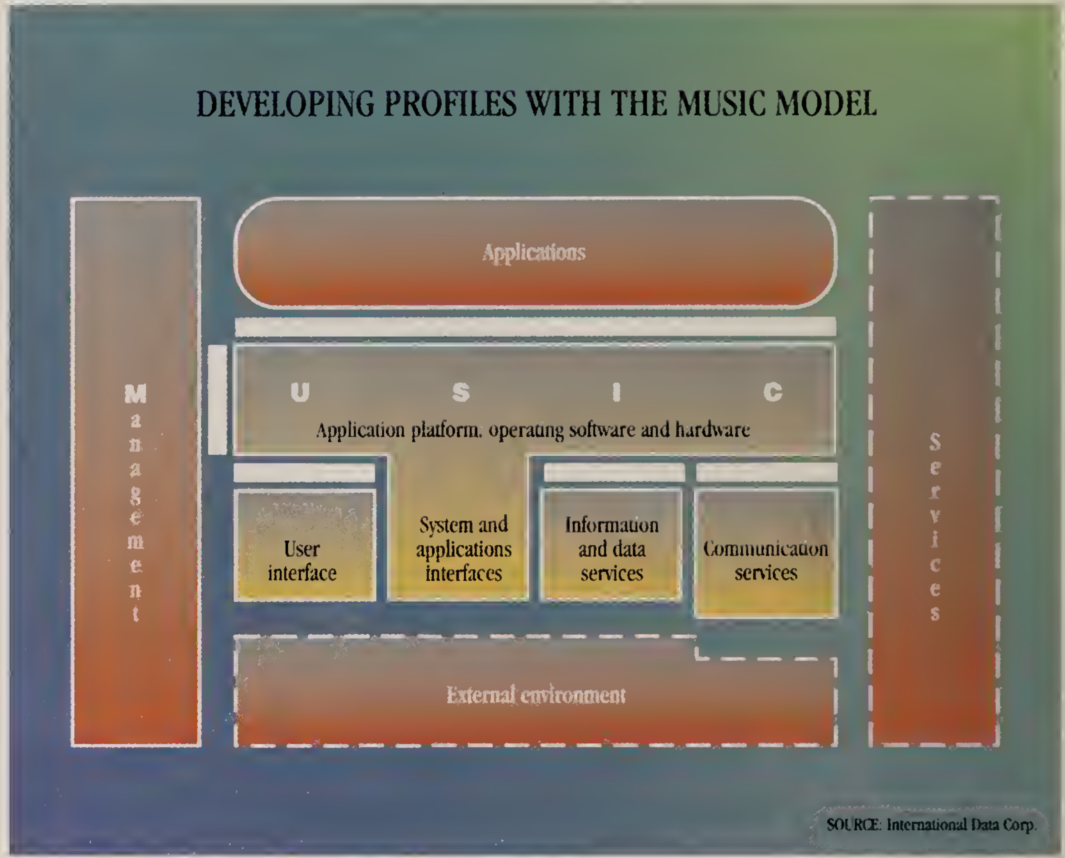
PROFILING

In order to minimize the chance of being locked into standardized middleware, many users and user standards organizations have adopted a process called profiling. A profile is a suite of standards that specify the functionality needed to support the requirements for a given purpose.

Using profiles can pay off for users in many ways. They can provide a methodology to leverage the use of standards within their own corporations and on a much broader scale. Much work of this type has already been done within corporations. Although not always recognized as profiles, the work often takes the form of corporate guidelines, standards, or specifications. These often are used in the standards requirements sections of RFPs.

Profiles are commonly used to specify either a complete open systems environment or an application-specific environment. The former are called Open Systems Environment (OSE) specifications while the latter are called Application Environment Profiles (AEP).

An AEP identifies the needs of the application area, the standards available that meet those needs, and any gaps that may exist between the needs and the standards. As previously mentioned, there may be non-standardized technology available to fill these gaps. Examples of application areas that could have their own profiles include Computer-Aided-Design (CAD), PC-based software and supercomputing. Although some of the components of the profiles could be similar, or even identical, they are usually quite different.


DEVELOPING PROFILES WITH THE MUSIC MODEL
Applications
Management
U
S
I
C
Application platform, operating software and hardware
User interface
System and applications interfaces
Information and data services
Communication services
Services
External environment

SOURCE: International Data Corp.

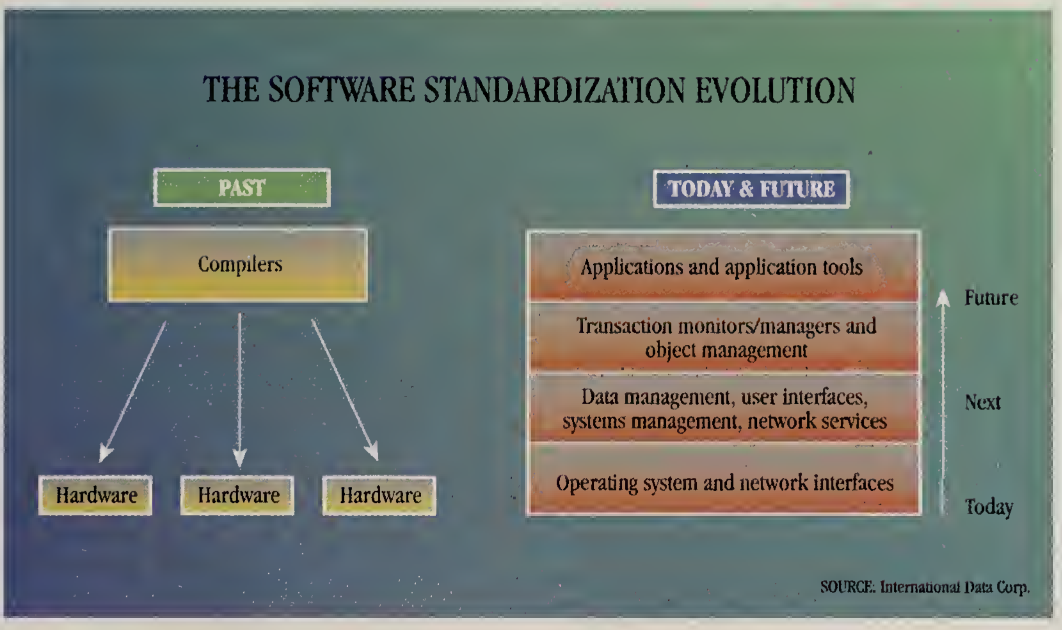
Profiles, or internally-developed standard suites, can be developed by employing the MUSIC model: *M*anagement, *U*ser *S*ervice interface for programs, *I*nformation and data formats, and *C*ommunications interfaces.

Given the many standards and technology choices in the middleware area, there are a multitude of ways to organize them within profiles. A model for developing profiles has been developed by the Central Computer and Telecommunications Agency (CCTA) in the United Kingdom. The model is known as Management, User Service interface for programs, Information and data formats, and Communications interfaces (MUSIC). Elements of the MUSIC model are also found in middleware. By utilizing the MUSIC model, users can compare the various approaches taken by open systems and standards organizations. The model can also represent an OSE profile.

THE ROLE OF OPEN SYSTEMS AND STANDARDS ORGANIZATIONS

Differences between the profiles can often be a result of the varying market segment or customer base they are trying to serve. Examples of OSE profiles specified by well known standards organizations include:

- X/Open's Common Application Environment (CAE). X/Open's model is based on its XPG (X/Open Portability Guide). Version 3 of this profile (XPG3) is a widely accepted profile in the industry today.
- The Open Software Foundation (OSF) Application Environment Specification (AES). The AES originally specified many formal standards. Examples of items that have been added to the AES include the Motif Graphical User Interface (GUI), Distributed Computing Environment (DCE) and Distributed Management Environment (DME).
- Unix International's (UI) Atlas framework for Open Systems. UI's Atlas is a framework for procurement similar in concept to IBM's Systems Application Architecture. Atlas specifies Unix System V Release 4, Open Systems Interconnect networking standards, and the popular Motif and Open Look GUIs. It also specifies such distributed computing technolo-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Hardware
Hardware
TODAY & FUTURE
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Transaction monitors/managers and object management
Data management, user interfaces, systems management, network services
Operating system and network interfaces
Future
Next
Today

SOURCE: International Data Corp.

Standards fill in complex application development gaps, creating a more integrated set of standard software.

gies as OSF's DCE and Sun Microsystems' Open Network Computing (ONC).

- The National Institute of Standards and Technology's Application Portability Profile (APP). APP is heavily based on formal standards from the Institute for Electrical and Electronic Engineers (IEEE).

Largely as a result of frustration with the extreme slowness of existing standards bodies, many new standards bodies — and proposed standards — are coming into existence. Their proposed standards create even more choices for users, who must decide which standards to specify and adopt.

These new breeds of standards organizations come in the forms of consortia and user-driven organizations. Examples of user-driven organizations include the User Alliance for Open Systems and Standards for Open Systems (SOS). Many organizations have representatives in both SOS and the User Alliance for Open Systems.

Both organizations are trying to facilitate the move to cost-effective open systems by articulating user requirements. Their ultimate goal is improved productivity, quality and end-user satisfaction. IDC believes that there is a need for these groups to combine their efforts.

SOS consists of a group of executives from 10 large end-user customers. They are American Airlines, Du Pont, General Motors, Kodak, McDonnell Douglas, Merck, Motorola, 3M, Northrop and Unilever. They have met in an informal, unstructured group on a few occasions to exchange views regarding their common interest in accelerating the commercial availability of open systems based on vendor-neutral standards.

SOS has a somewhat less broad scope than the User Alliance for Open Systems. It is focused on establishing requirements for using profiling. It is looking for quick results by taking advantage of existing processes rather than defining and implementing a new set of processes for information exchange.

COS is an international, non-profit, organization composed of users, vendors, and government agencies. Its mission is to accelerate the introduction of standards-based open systems products and services, and to assist users in achieving practical interoperability. COS is also the umbrella organization for the North American MAP/TOP Users Group, the OSINET Corporation, the ISDN Executive Council and the User Alliance for Open Systems.

JOINT PROFILING DEVELOPMENT

IDC believes that the concept of profiling can be greatly advanced if users work with each other as well as collaborate with organizations such as the User Alliance for Open Systems and SOS. By working together towards common profiles, many benefits can be realized:

- users will be able to share in the work and eliminate duplication of effort
- users can leverage volume discount potential within corporations
- collectively, groups of users can increase their influence over vendors.

By steering vendors toward certain standards, mass-produced products based on these standards should be relatively inexpensive.

CONCLUSION

After a sometimes arduous 20-year IS evolution to mainframes, minicomputers and desktop computers, companies find themselves on the threshold of a fourth computing wave: the Software and Networking Infrastructure. This fourth wave will attempt to sensibly lace together the many disparate islands of technology created by the first three waves.

The motivating force behind this software and networking effort is the lure of open systems, an environment where computer users will be able to share business and administrative information transparently regardless of their computer types.

The success of open systems will largely depend on the quality and capabilities of the industry's middleware, the software that smooths the troubled waters between applications and computer systems.

The focus on open systems is not merely the brainchild of idle systems analysts or hungry technology vendors. It is being mandated by the needs of the business and the importance of improving the bottom line. Open systems promise less emphasis on technology and more on productivity and customer service. And open systems, implemented properly, can offer more predictable IT investment patterns and resource planning.

The nature of open systems will be determined by individual company needs and business standards. These will provide a framework that can accommodate innovation while still adhering to the fundamentals needed to accomplish company goals.

Open systems, driven by business needs and the desire for investment protection, will become the goal of every company wanting to optimize its information technology resources in the '90s.

IDC White Paper

OPEN SYSTEMS FROM AN END-USER PERSPECTIVE

Banyan ready to ship its Vines 3270 gateway

Alternative to gateways between Vines, SNA

BY JIM NASH
CW STAFF

CHICAGO — Banyan Systems, Inc. said it is ready to ship its Vines Communications Gateway for 3270, which it introduced last October. The announcement, made earlier this month at the Association of Banyan Users International here, was greeted with understated gratitude by network managers.

"This was needed," said Tony Hinton, telecommunications manager at Agribank of St. Paul in Minnesota. The software is likely to become the favored alternative to gateways between IBM Systems Network Architecture (SNA) and Vines networks, several network administrators said.

As much as 70% of Banyan's customer base has an IBM mainframe, said Bill Johnson, the company's product marketing vice president. No plans for following IBM's migration from SNA to Advanced Peer-to-Peer Networking architecture have been released, according to Johnson.

The gateway was co-developed by Digital Communications Associates, Inc. (DCA) and is based on DCA's Irmalan/EP SNA Gateway Version 3.0. Client versions for DOS and Apple Computer, Inc. Macintosh users are expected to ship this month. A Microsoft Corp. Windows client version should ship this quarter, according to Banyan. Vines 4.1, 4.11 and 5.0 will support the new software.

Banyan already has its own gateway, the Banyan 3270/SNA, which supports only DOS clients. Third-party gateways do exist, said Dick Crumb, an Agribank telecommunications analyst, but many use IBM's NetBIOS protocol. NetBIOS does not work well on wide-area networks, given its relatively high software overhead, according to Crumb.

Byron Comp, president of the Banyan user group and a network manager at Andover, Mass.-based retailer Marshalls, said having a more versatile gateway from Banyan helps information systems managers. For one, it will reduce the number of desks with both a personal computer and a terminal. Plus, it is software from Banyan, which should cut down on finger-pointing when problems arise, Comp said.

DOS gateways, which support a maximum of 96 concurrent DOS users, will be priced from $1,495 to $7,495. Macintosh and Windows client versions will each cost $3,995.

Cogent opens multinet views

BY JIM NASH
CW STAFF

Third-party software designed to scale the walls between network operating systems is winning friends among network managers. The software promises to offer a level playing field for high-end networking competitors Novell, Inc. NetWare and Banyan Systems, Inc. Vines.

Cogent Data Technologies, Inc., with its Open Windows Connection, has impressed some network managers with both its broad support of transport protocols and its customer support. Version 1.1 of Open Windows is due to ship at the end of the month, according to the Friday Harbor, Wash.-based software developer.

The software enables end users to connect to competing network operating systems from one personal computer. It also automates the process of logging on to different system servers. Network managers are supplementing existing systems — Vines, for example — with other systems such as NetWare to address different needs, said Jamie Lewis, an analyst at The Burton Group, a consultancy in Salt Lake City. Industry estimates indicate that half of all Vines shops also have NetWare.

Multiple support

Open Windows Connection Version 1.0, which has been available for about five months, supports numerous protocols, including Novell's Sequence Packet Exchange/Internet Packet Exchange, Transmission Control Protocol/Internet Protocol, Simple Network Management Protocol, Network File System and NetBIOS.

Besides Vines and NetWare, the product supports Unix, Microsoft Corp.'s LAN Manager Version 2.0, Digital Equipment Corp.'s VMS and Sun Microsystems, Inc.'s network operating systems. Version 1.1 will include support for DEC Pathworks for DOS, LAN Manager 2.1 and Windows 3.1.

"We looked at three packages doing this kind of thing," said Jimmy Mock, corporate director of computer systems at The Benham Group, Inc., an architectural consulting firm in Oklahoma City. Benham tried Cogent, Spry, Inc. and 3Com Corp. connectivity software. Mock said all three offered roughly similar capabilities at comparable prices. He chose Version 1.0 of Open Windows Connection.

"Cogent had the best documentation and [user] support," Mock explained. "It was the simplest to set up and use." Plus, he said, Open Windows Connection bundled together the protocol support with Windows capabilities. Spry, Mock said, sells the two separately.

In addition, the software allows Benham to use NetWare for database work, an advantage because NetWare processes database requests on the server. Vines downloads files to the client and does the processing there, he said, which slows down operations.

It is the sheer number of protocols Open Windows Connection supports that attracted Joseph Johnson II, project manager at General Dynamics Space Systems Division in San Diego. "We have a big 3Com installation, but we also have lots of Unix, some [Hewlett-Packard Co. equipment], some VAX and mainframe systems," Johnson said. He is also using Version 1.0.

"At first we were leery of [Open Window Connection's] uniqueness. Our concern was that Microsoft was going to make this thing obsolete by incorporating its features into a product," Johnson said. "We asked Microsoft, and they said they wouldn't put this in Windows. So far, this is the only product which gives us [the versatility] we need."

Vines, ODI integration

The software is the only application that allows Banyan's Vines and Novell's Object Data Interface (ODI) to work together, said Peter Ho, senior software development engineer at Mohawk Data Sciences, a network integrator in Toronto. Other connectivity software links Network Driver Interface Specification (NDIS) to other transport protocols.

But ODI "has some conflicts" with NDIS, he explained. And the software Mohawk creates to integrate applications does not support IPX, the only other transport protocol from Novell that works with NDIS, Ho said.

"We got it in March," Ho said. "The speed is good. It uses a little bit of memory, but it's high memory and has almost no effect on the workstations." He explained that Mohawk is in the process of developing an integration product using Open Windows Connection Version 1.0.

NEW PRODUCTS

Local-area networking hardware

Xircom, Inc. has announced enhancements to the software for its line of Pocket Ethernet Adapter II products.

Version 2.0 of the software provides better performance and includes an Enhanced Parallel Port driver, which improves parallel port throughput for notebook computers based on the Intel Corp. 386SL chip.

The improved software is included with all new Xircom Pocket Ethernet Adapter IIs. Registered users can obtain the software upgrade via bulletin boards.

Xircom
Suite 114
22231 Mulholland Hwy.
Woodland Hills, Calif.
91364
(818) 884-8755

Interphase Corp. has announced a new Fiber Distributed Data Interface network concentrator with up to 16 ports.

The stand-alone FiberHUB 1600 is modular, allowing users to incorporate from 8 to 16 ports in increments of two. Fiber and copper media are both supported in any combination. Simple Network Management Protocol support is available.

The product is scheduled for July availability.

Pricing begins at $13,995 for an eight-port configuration.

Interphase
13800 Senlac
Dallas, Texas 75082
(214) 919-9000

Electronic mail

Futurus Corp. has announced that its Futurus Lite Mail electronic-mail package will be included in all future shipments of the Eagle Technology NetWare Lite Ethernet Starter Kit.

The Starter Kit ($615) includes Eagle Technology adapters and Novell, Inc.'s NetWare Lite network operating system. Futurus Lite Mail provides message sending, forwarding and archiving capabilities, plus low memory overhead and Message Handling System compatibility, according to Futurus.

Futurus has also renamed its Right Hand Man groupware products. The product line is now named Futurus Team.

Futurus
Suite 290
211 Perimeter Center
Pkwy.
Atlanta, Ga. 30346
(404) 392-7979

Diagnostic equipment

Beckman Industrial Corp. has introduced the TMT-10 Signal Injector.

Designed for Local Area Network and Telecommunication wiring system certification, the TMT-10 can tell whether a twisted or flat pair cabling system will serve as effective data transmission media.

Users can test their twisted pair cable on the spool prior to installation. The TMT-10 signal Injector tests all local-area network and Telecom wiring topologies, including 10Base-T, Token Ring and all six- and eight-wire twisted pair telecommunications standards, according to the company.

The TMT-10 is priced at $195.

Beckman Industrial
3883 Ruffin Road
San Diego, Calif. 92123
(619) 495-3200

Data storage

Emeritus Technologies has announced TapeWare Version 4.0, an updated version of its tape archive management software for Novell, Inc. NetWare local-area networks.

The new version is designed to handle library systems including stackers and autoloaders, the company said. The program is improved to require less memory on DOS-based workstations, and performance in some functions is increased by as much as 75%.

New security features and communications testing features are also included.

The software is bundled with all Emeritus Technologies archival systems.

The company has also designed the TapeWare/QC-1000 ¼-in. cartridge system with 1G byte of storage capacity. It is priced at $1,895 as an external subsystem.

Emeritus Technologies
2750 N. Clovis Ave.
Fresno, Calif. 93727
(209) 292-8888

Cipher Data Products, Inc. has designed an 18.2G-byte tape library for use with Novell, Inc. NetWare local-area networks.

The Cipher Mini-Library includes the company's Ciera 2.6G-byte tape drive and access to seven tape cartridges. In conjuction with Cheyenne Software, Inc. networking software, it allows 48M byte/min. backup of network data.

List price is $19,950, according to the company.

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San Diego, Calif. 92131
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CharterHouse Software Corporation
818-879-2400
Barry Lederman

Distributed Systems Solutions
International (DSSI)
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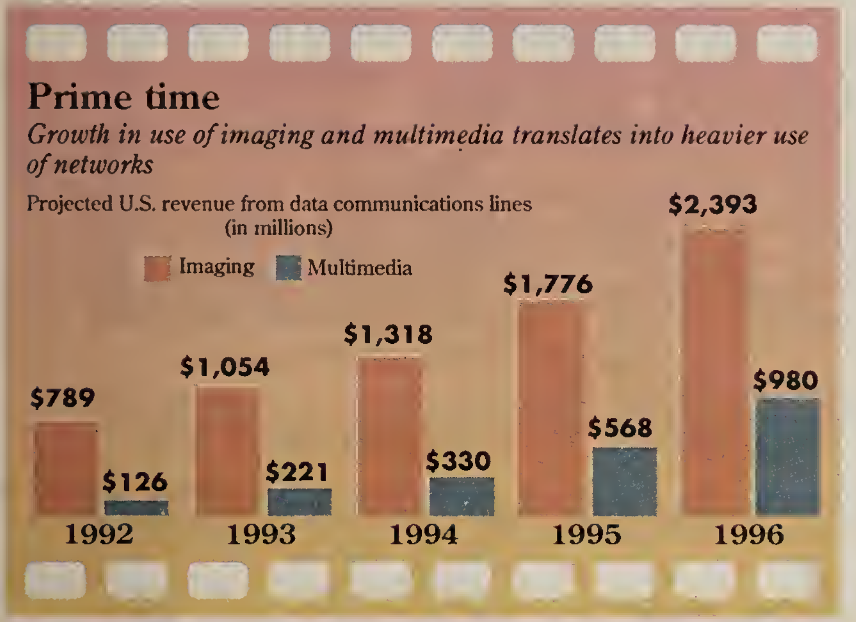


Prime time

Growth in use of imaging and multimedia translates into heavier use of networks

Projected U.S. revenue from data communications lines (in millions)

Source: The Insight Corp.

Multimedia seen as spur to network growth

BY ELLIS BOOKER
CW STAFF

LIVINGSTON, N.J. — Multimedia applications will drive telecommunications technology into the 21st century, according to a recent study by The Insight Research Corp. here.

The firm's research suggests that during the next five years, revenue from multimedia and networked multimedia desktop systems will grow 14% and 42%, respectively.

Insight's study, "Multimedia Computing & the Network: Applications & Telecommunications 1992-1997," predicts that multimedia (both real-time applications and transmitted multimedia files) will significantly spur sales of high-speed data communications equipment and public network services. According to the report, approximately 77% of all educational and industrial personal computers or workstations shipped in 1997 will come equipped with some communications capabilities. Of these, 21.6% will be capable of networked multimedia applications, up from just 4.8% today.

Rapid growth

In addition, Insight calculated that the percentage of carrier service-revenue from multimedia applications will increase from 0.9% today to 6.1% by 1997, with an average annual growth rate of 45%. The overall network services market is expected to grow from $13.4 billion today to $27.6 billion in 1997.

Imaging applications, as distinct from multimedia, will see a 32.5% growth by 1997 to $3.2 billion of the total network services market, according to Insight.

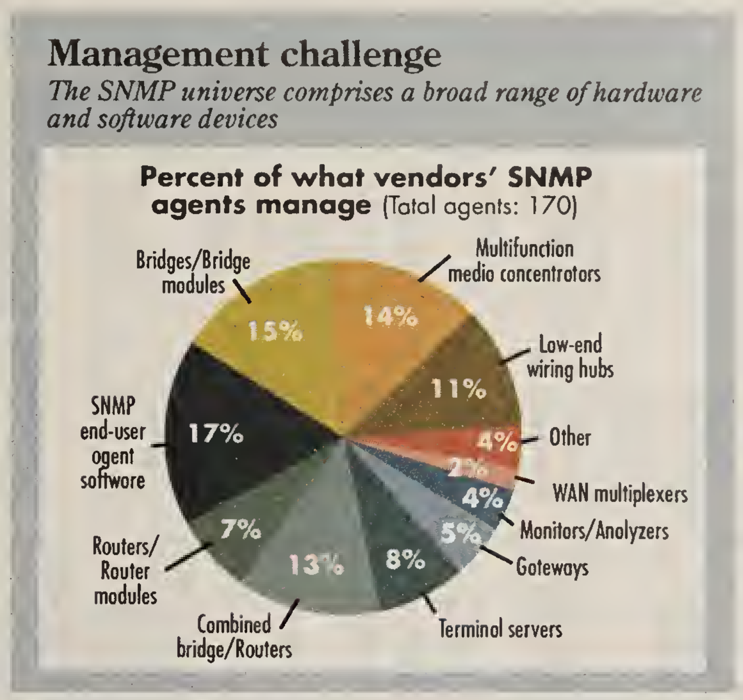
A challenge to telephone companies, the study added, will be to deploy high-speed offerings such as Switched Multimegabit Data Service (SMDS) and frame relay to accommodate this marketplace. In fact, Insight said it predicts that of all network technologies, digital

Continued on page 66

Caveat emptor on SNMP tools

Study warns that a quarter of SNMP agents are not fully compliant

BY ELISABETH HORWITT
CW STAFF



Management challenge

The SNMP universe comprises a broad range of hardware and software devices

Source: Mier Communications, Inc.   CW Chart: Janell Genovese

PRINCETON JUNCTION, N.J. — Purchasing a router, hub or personal computer that supports the Simple Network Management Protocol (SNMP) standard may not guarantee that the device will be fully manageable by an SNMP management system, according to a recent study conducted by Mier Communications, Inc.

SNMP is a de facto industry standard developed by the Internet Engineering Task Force (IETF) for managing Transmission Control Protocol/Internet Protocol (TCP/IP) networks and, increasingly, other network types.

Mier surveyed vendors who have developed some 170 SNMP agents, which reside in the network device to manage and set up two-way communications with an SNMP management workstation. The survey found that 25% of those so-called SNMP-based agents do not yet support "the full range of basic requirements" laid out in the standard, according to Mier's president, Edwin Mier.

A user who buys a partially compliant SNMP product "may not get a particular notification, such as an alert that your hub has just lost power," Mier said. Or a network management system may be unable to send messages to a device to implant information about its location or port configurations for later reference, he added.

Most of the vendors whose products were not yet fully SNMP-compliant told Mier that they would remedy the omission "as soon as possible." Mier interpreted this to mean sometime in the next 6 to 18 months.

> MOST OF THE vendors whose products were not yet fully SNMP-compliant said they would remedy the omission "as soon as possible."

Vendors have not deliberately dragged their feet on full SNMP compliance, Mier said. The problem is that many network devices were designed before SNMP was fully defined, and they do not work well with the standard, he added.

For example, SNMP decrees that a local-area network interconnectivity device count every byte of data that goes through its ports. This requirement tends to slow down the throughput of bridges, which are designed to pass LAN packets over a LAN internetwork with minimal processing.

Another factor that is obstructing standardized, multivendor SNMP management is that 80% of vendors surveyed had implemented management information base (MIB) extensions on their SNMP agents. The basic SNMP standard put out by the IETF consists of MIB objects that define how certain types of information are passed to the management station. For example, one MIB object might define how a router sends information about traffic levels on its ports.

However, many vendors have concluded that their particular router, smart wiring hub or workstation has unique qualities that the standard SNMP MIBs do not adequately manage. Such vendors have developed MIB extensions designed to manage their particular devices' quirks.

For example, the standard SNMP MIBs only handle TCP/IP traffic, while Cisco Systems, Inc. routers also handle a

Continued on page 64

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Sprint, Telematic fight phone fraud

BY ELISABETH HORWITT
CW STAFF

Two companies have come up with offerings designed to reduce unauthorized use of long-distance telephone services.

U.S. Sprint Communications Co. has announced what is said to be the first program in which a telecommunications company shares phone-fraud liability with its customers.

Sprintguard Plus is a global security service for Sprint's International Ultra WATS, International Virtual Private Network and International Clarity private-line services. It offers the following protection:

- Covers losses of $25,000 to $1 million per year per telephone switch or private branch exchange (PBX) through a shared liability contract.
- Details fraudulent calls and compiles thorough call reports.
- Analyzes daily use and notifies customers of abnormal traffic patterns.
- Provides a dedicated security expert to assist customers during times of "active fraud."
- Publishes bulletins about recent advances in communications fraud and available prevention methods.

The service is now available to businesses that commit to purchasing at least two years of Sprint voice service at a rate of $30,000 or more per month and that follow Sprint's guidelines to minimize fraud. The service is priced per PBX.

Another fraud-fighting tool that hit the market recently is Western Telematic, Inc.'s Pollcat II+, an enhancement to the Irvine, Calif.-based vendor's Pollcat II call accounting software for PBX systems.

The enhancement is said to catch unauthorized use of a PBX system's long-distance lines by monitoring call records and notifying the user when calls meet certain preset parameters. Typical conditions that would trigger an alarm include an excessive number of short calls trying authorization codes, after-hours or weekend calling or calls made to or from certain locations.

SPRINTGUARD PLUS DETAILS fraudulent calls, compiles thorough call reports and publishes bulletins about prevention methods.

Once triggered, the device can be programmed to alert a network manager in several ways. It can turn on a visual indicator or send alerts to a local or remote personal computer or to a pager, Western Telematic said.

Once alerted, the network manager can block further break-ins by changing the PBX system's Direct Inward System Access code since unauthorized access to that code is the common method of gaining unauthorized use of PBX lines. Pollcat II+ can also generate reports of the events that triggered the alarm.

The product is said to be compatible with any PBX that sends ASCII data via an RS232 port. Priced at $1,795, it is scheduled to ship in July.

Caveat emptor on SNMP support

CONTINUED FROM PAGE 63

variety of other transport protocols, including Digital Equipment Corp.'s DECnet and Novell, Inc.'s IPX. Cisco has implemented MIB extensions on its routers that enable an SNMP management station to query them about the different types of traffic they support.

While such extensions can expand the manageability of these devices through SNMP, they must first be implemented on whatever SNMP management system the user has. Hewlett-Packard Co., which sells the SNMP-based OpenView Network Node Manager, provides compilers that enable users to add whatever MIB extensions they want, Mier said. The problem is it can take a month or two for a user to learn how to do this.

Sun Microsystems, Inc. has made it easier to add MIB extensions to its SunNet Manager by providing a bulletin board of extensions, which users can then download to their systems, Mier said. The drawback here is that Sun cannot provide all MIB extensions now on the market — although it has several dozen at this point.

The good news is that many vendors said they were in the process of implementing additional SNMP-based standards that are now being finalized by the IETF, Mier said. For example, both HP and DEC have just announced support for the Remote Network Monitoring protocol that standardizes how LAN monitoring systems can send information to an SNMP workstation.

Other SNMP MIBs now in the works include a MIB to manage Ethernet devices, a similar MIB for Token Ring and a MIB to manage smart wiring hubs.

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What BRG did was to interview the day-to-day LAN managers at 180 different organizations about the length of time required to execute 11 typical network functions.

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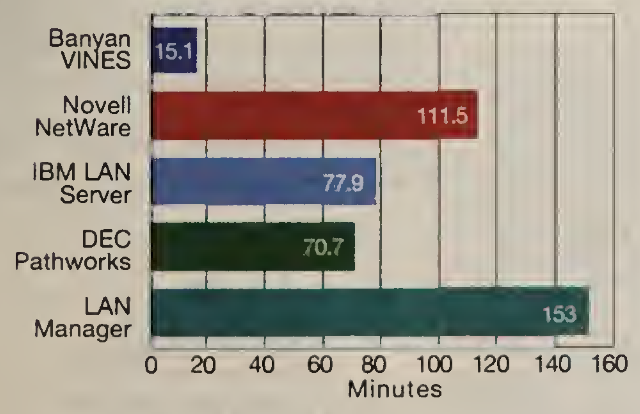

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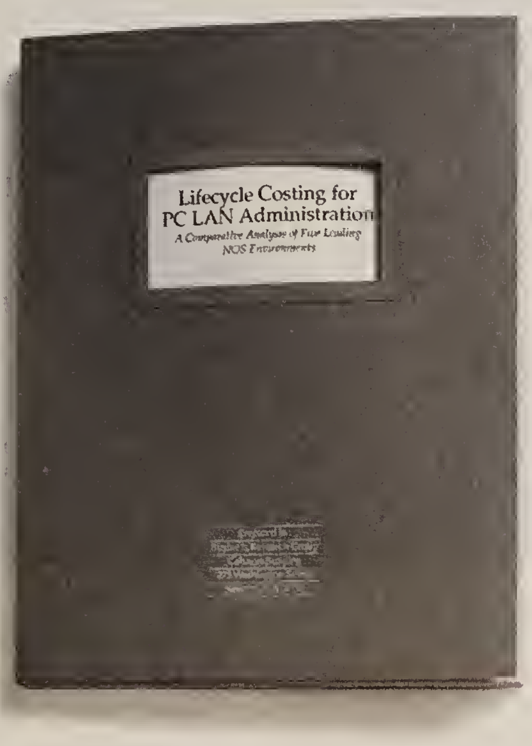
For sheer cost-effectiveness, Banyan surpasses everyone.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IN BRIEF

MFS fiber-optic network Chicago-bound

■ **Metropolitan Fiber Systems** (MFS), a competitive access carrier, announced earlier this month it would interconnect its fiber-optic network with facilities from Central Telephone Co. in Illinois by year's end. The agreement with Central Telephone, a unit of Chicago-based **Centel Corp.**, will enable Centel customers to reach nodes on the MFS fiber system in downtown Chicago, which reaches nearly 1,000 buildings. MFS is already physically interconnected to 10 Nynex local central offices in New York and Boston. MFS also said it expects a midyear ruling from the Federal Communications Commission on its request that there be a federal mandate for the interconnection of competitive access providers.

■ Hank Lavery, vice president of transportation products at Sterling Software, Ordernet Services Division, was elected chairman of the **Data Interchange Standards Association Board of Directors.**

■ X terminal maker **Network Computing Devices, Inc.** (NCD) said it has been named a subcontractor by Computer Sciences Corp. and will provide 13,000 color and monochrome terminals to the U.S. Department of Defense's Joint Computer-Aided Acquisition and Logistic Support system. The system was created to automate the federal government's receipt, management and use of weapons information. NCD said it will begin supplying the devices, which leverage the graphics-oriented X Window System protocol for tying together computer resources, in the middle of this year.

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Multimedia spurs growth

CONTINUED FROM PAGE 63

switched data services, including broadband Integrated Services Digital Networks and SMDS, will see the greatest growth. The switched data market is expected to shoot from $2.31 billion today to $5.89 billion by 1997.

While local public carriers appreciate the potential demand for high-bandwidth services, many are constrained by government regulations and an infrastructure that will take decades to upgrade, Insight President Robert Rosenberg said.

"Investments in new switches and fiber cable cannot be made quickly [particularly by the local telephone companies], since these are regulated companies that must depreciate their current investments," said Rosenberg, whose primary consulting clients are public carriers.

Rosenberg pointed to a study by one of the seven regional Bell holding companies, for example, that indicated that if fiber were mandated in the normal replacement cycle for copper cabling, it would still take 15 or more years to convert half of that one company's network to fiber.

Go team!

Late last month, Pacific Bell, IBM and Northern Telecom, Inc. announced they would jointly research networked multimedia applications.

The first phase of the project will research how voice, text, video and image can be integrated across a network. The second phase will attempt to define network capabilities required to support these applications. The overall goal is to have the first application — desktop-to-desktop videoconferencing and file sharing using Integrated Services Digital Network (ISDN) technology — by year's end.

The three participating companies will share the results of their investigations with Bellcore, the research and development arm of the seven regional Bell holding companies. They are also discussing broadening the project to include compatibility of their applications with emerging wide-area networks, such as frame relay and broadband ISDN.

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APRIL 1992

DIGITAL UPDATE

THE OPEN ADVANTAGE

digital

Striping BREAKS *the* I/O Bottleneck

Quick Solutions from the Quickest Form of RAID

Over time, technology has increased in power and performance by leaps and bounds. Yet, those leaps aren't always equidistant. For example, the processing power of high-tech computer systems is still very much ahead of the advances made in the area of disk I/O performance.

For you, this means a growing gap between your system's ability to process and your I/O device's ability to deliver data for processing. Simply put, you're left with data bottlenecked in the system until your disk drive plays catch-up.

Digital has the solution. We have closed the technology gap and relieved the I/O bottleneck with the introduction of VAX Disk Striping Driver software for VMS.

Striping Gets Rave Reviews

Tom Stewart, a VAX systems administrator for Information Handling Services in Denver, had a major I/O problem: his VAXcluster was too slow in accessing critical data. Database applications such as ORACLE, Ingres, and Rdb needed a system that could quickly process many small transactions.

The solution: VAX Disk Striping Driver for VMS. With striping in place, Stewart was able to triple his I/Os per second. What's more, this increase in I/O performance more than doubled the number of batch jobs able to be processed per day.

Striping Is RAID at Its Best

You may already know what RAID (Redundant Array of Inexpensive or Independent Disks) technology is: a cost-effective method for increasing I/O performance by grouping disks so that multiple spindles can be managed as a single unit. What you may not know is that of six RAID methods — each providing varying levels of security and speed — striping is the fastest.

What's more, striping applications can perform extraordinarily fast I/O using a standard Digital Storage Architecture (DSA) controller and disk devices. When striping is used in conjunction with Disk Shadowing and VAXsimPLUS, you get a very high performance and high availability storage unit.

How Striping Works

A disk becomes "hot" when many concurrent or overlapping requests are made for data stored on it. If a system with hot disks also has underutilized disks, striping organizes all of these together into a "stripeset" — letting you balance their respective work loads more evenly by reducing the probability that a request will arrive at a busy disk. With striping, this automatic "statistical load balancing," as it is called, minimizes average response time for the entire work load.

Of course, you can load balance a set of disks manually. However, load balancing through disk striping has two clear advantages:

Savings on Labor

Disk striping balances the I/O work load by spreading accesses to all files evenly across multiple disk drives. No continuous effort is required on the part of the system manager because the I/O work load of a stripeset remains automatically balanced, no matter which files are hot.

On the other hand, load balancing via the manual procedure is labor-intensive, requiring both system manager analysis and application modifications. Plus, the procedure must be repeated periodically due to changes in system I/O work loads over time.

Savings on Time

Load balancing via disk striping occurs in real time, with I/O requests spread across disks as they occur.

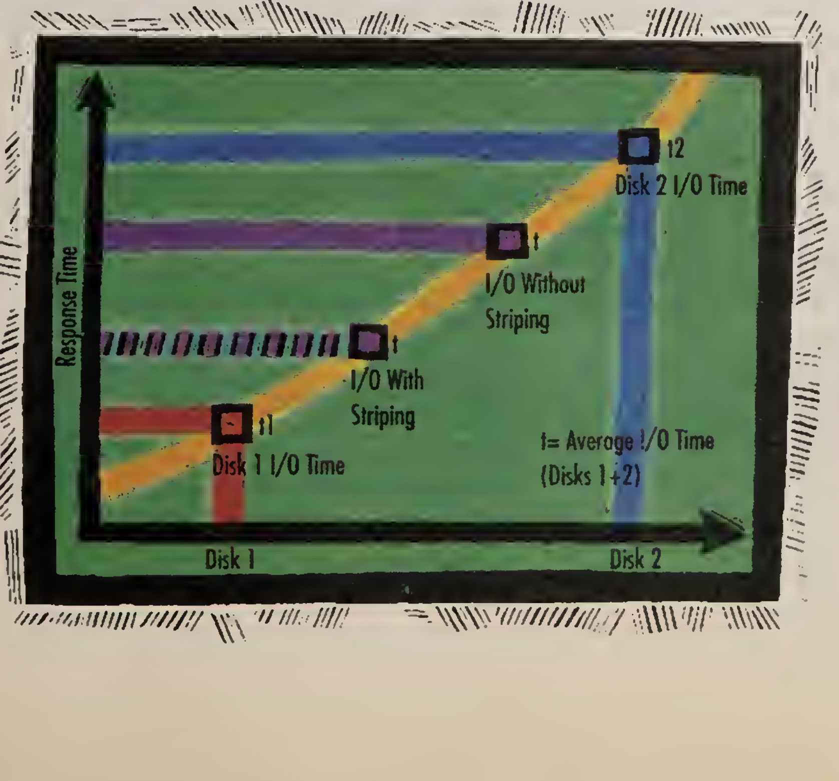
Manual load balancing uses past system I/O behavior to predict future behavior. Because response to workload changes occur after the fact, you may miss your chance to respond to rapidly changing work loads.

In addition, striping can significantly increase the bandwidth (data transfer speed) for applications using large files.

Call Now and Receive a FREE Striping Guide

Increase your I/O performance without adding hardware. In most situations, striping software is all you need.

To order, or for more information on the VAX Disk Striping Driver for VMS, call 800-DIGITAL (800-344-4825), ext. 234. Be among the first 100 callers and you'll receive a FREE *Striping Performance and Tuning Guide*.



Here, Disk 1 is underutilized while Disk 2 is saturated. Without striping, both disks remain unbalanced. Thus, the average I/O response time (t) for the entire work load is closer to the slow I/O response time of the saturated disk (Disk 2).

With striping, Disk 1 and Disk 2 are balanced evenly in a stripeset. This disk balancing succeeds in minimizing the average I/O response time (t) of the entire work load.

All told, striping gives you the flexibility to configure your I/O device to your application's I/O characteristics.

EASE OF USE + PRODUCTIVITY = dBASE IV for VAX VMS

A Digital/Borland International solution, dBASE IV for VAX VMS gives you PC-level ease of use, and offers benefits that are both time-saving and cost-effective, including:

- Multiuser functionality
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- Application and data portability across DOS-based PCs and VAX VMS systems
- Built-in features ensuring security and integrity of data
- Improved ability to develop even more complex dBASE IV applications by taking advantage of virtual memory, larger and faster disks, batch processing, multi-tasking, and faster CPUs on large VAX systems
- Ability to access external databases such as VAX Rdb/VMS, RMS, ORACLE, and IBM's DB2 through Digital's Network Application Support (NAS) services.

If you're an end user, dBASE IV for VAX VMS has the capability to perform simple to complex queries quickly and easily, without programming. If you're an applications developer, dBASE IV for VAX VMS offers you a host of sophisticated tools to maximize application development productivity.

dBASE IV Is User-Friendly

Spend less time on tedious programming and more time analyzing the business issues and the desired end result.

The Control Center of dBASE IV for VAX VMS is your link to a host of powerful and inventive design tools that offer you a simple way to access data and information with minimal technical knowledge. These tools enable you to develop applications quickly and effortlessly, and include:

- Table Designer used to create data tables
- Form Designer for fast layout, viewing, and updating of data
- Report Designer for on-screen design of custom format reports, including columnar reports, complex multi-table reports, preprinted forms, and mail-merge documents
- Query-By-Example (QBE), enabling you to access information by defining and generating logical views based on relationships among multiple tables — without programming.

What's more, all dBASE IV design tools are tightly integrated, making it easy for you to move between capabilities.

Quick and Cost-Effective

dBASE IV for VAX VMS gives application developers the flexibility of an extensive fourth-generation language (4GL), plus sophisticated application development tools to get the job done. These tools include:

- Automatic Code Generator which integrates Control Center design tools with the dBASE language
- Template Language for custom-tailoring generated code to your specifications
- Integrated Debugger and Program Editor for streamlining the development process
- Application Distribution Utilities.

Features You Can Really Use

With dBASE IV, you get a feature-rich application development language, plus a choice of data management systems (.dbf or VAX Rdb/VMS). What's more, this software takes full advantage of VAX VMS system resources and data access services.

Order #	License Type	Price
QL-YE1AA-2B	1-User Personal Use	$795
QL-YE1AA-3B	1-User Concurrent	$1,895

Note: Cluster-wide license also available.

For information, or to order dBASE IV for VAX VMS, call 800-DIGITAL (800-344-4825).

+ + + + + + + +

A Word from Borland: Your Future with dBASE IV for VAX VMS

> “Borland International's continued support and enhancement of dBASE IV for VAX VMS is solid proof of its commitment to providing customers with quality, value-added products. In fact, the future of dBASE is already under development to be functionally compatible with the next version of dBASE IV for DOS.
>
> Our partnering with Digital Equipment Corporation combines our software craftsmanship with the expertise of the world's leading supplier of networked computer systems. This combined experience will enable us to continue to jointly market and support dBASE IV for VAX VMS.
>
> dBASE IV for VAX VMS meets the needs of customers who want the robustness of the VAX environment and the application development ease-of-use available with the dBASE IV product. Customers can be assured of continued support from both Borland and Digital — a partnership that guarantees a solid future for value-added dBASE IV products.”

Philippe Kahn
President, Chairman, and CEO
Borland International

VAX Storage Library System (SLS): Datacenter Features at the Desktop

Automatically back up data from your workstation. Digital shows you how with VAX SLS for VMS V2.2.

VAX SLS for VMS V2.2 takes the pain out of remote backups by allowing you to transparently back up data onto your faster datacenter tape drives — TA90s, TA857s, or StorageTek ACS (tape silo), for example.

With SLS, backup operations at your site will increase in both speed and security. Adding to SLS efficiency is the fact that you need to manage the tape only in one location. Plus, backups can be scheduled automatically and distributed among clients to conserve CPU resources.

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Media management, backup management, remote backup management, archiving, scheduling — VAX SLS V2.2 does it all.

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SLS in the Real World

Digital Finland put VAX SLS V2.2 to work in its facility and benefited through significant savings of both time and resources. In fact, in one month's time, the facility increased storage capacity by eight percent, while it reduced the number of tapes by 30 percent and the number of tape drives by 75 percent.

You can garner great numbers, too. Utilize the SLS solution for all your backup and media management challenges.

Looking Ahead with SLS

VAX SLS for VMS V2.2 is a component of Digital's POLYCENTER Solution and an integral part of our overall NAS system management strategy — pointing SLS in the direction of future developments and improvements.

A VAX SLS V2.2 DECstart and DECstart PLUS service offering is available to help new customers with the implementation.

Order Information for SLS Remote (Client)

System	Order #	Price
VAXstation	QL-YE8A9-JB	$310
MicroVAX 3100	QL-YE8A9-JC	$615
MicroVAX II	QL-YE8A9-JD	$860
MicroVAX 3400	QL-YE8A9-JE	$1,230
VAX 4000-200	QL-YE8A9-JF	$1,640

Example: Get SLS Remote for 30 VAXstations in a Mixed Interconnect VAXcluster for $2,860. Or, $95 per workstation software.

Order Information for SLS (Server)

System	Order #	Price
VAX 4000-200	QL-0L7A9-JF	$6,000
VAX 4000-300	QL-0L7A9-JG	$10,500
VAX 4000-500	QL-0L7A9-JK	$19,700
VAX 6000-610	QL-0L7A9-JL	$22,800
VAX 6000-660	QL-0L7A9-JN	$32,700

Example: Get SLS for a VAX 4000 Model 300 system for $10,500. Or, $445 per workstation, including server software.

Note: Standard price includes one-year warranty. The Digital cluster-wide license policy applies.

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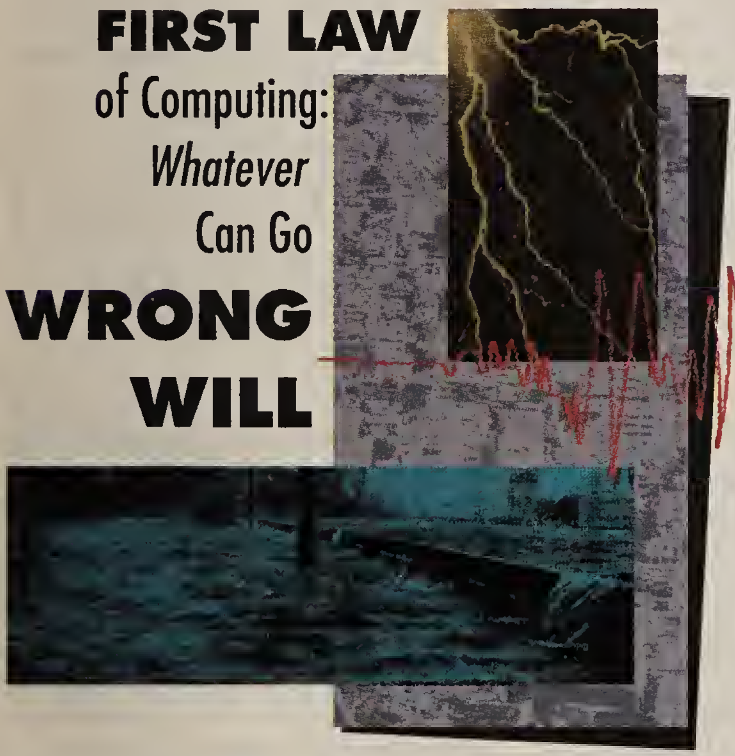
For a free DECpresent demonstration video, or to order, call 800-DIGITAL (800-344-4825), ext. 121.

FIRST LAW of Computing: *Whatever* Can Go WRONG WILL



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Murphy's Law spells trouble for today's computer-dependent businesses. When a disaster strikes a datacenter, even a few minutes of downtime can translate into significant financial loss for your company. No need for worry. You've got VAXcluster MDF, Digital's VAXcluster Multi-Datacenter Facility.

Most high-availability and fault-tolerant computing architectures minimize the risk of any single component failure. Yet, no single computer system, or the organization it serves — including yours — is immune from unforeseen factors that might render the entire system inoperable.

As the first disaster-tolerant computing system in the industry, VAXcluster MDF offers you the protection you need to keep your operation up and running.

Disaster-Proof Your Business with VAXcluster MDF

The VAXcluster MDF is a sophisticated software package integrating several technologies, including the industry-standard fiber-optic network of Fiber Distributed Data Interface (FDDI), VAXcluster, and VMS Volume Shadowing, for the purpose of combining separate datacenters into a single VAXcluster system.

Once established, the system provides redundancy of components, data files, and management capabilities for datacenters up to 25 miles apart — making it possible for one site to compensate for the other in cases of emergency.

Recovery Is Seconds Away

The sites in the VAXcluster system communicate and share resources during normal operations. But in the event of a disaster, loss of one site does not halt the capabilities normally provided by that site. Instead, with VAXcluster MDF, recovery at the second site is accomplished in under a minute, so that first-site business can continue as usual.

The Operations Management Station (OMS), a software component of MDF, is a key player in the recovery operation. OMS software allows for single-system management of both local and remote sites. Its functions include support for centralized or decentralized operation staffing, monitoring of system traffic for irregularities, and managing a wide range of malfunctions.

The VAXcluster MDF package includes services for site assessment, installation, testing, and training. Additional services are provided by our Business Protection Services and Network Integration Services — offering a wealth of technical expertise to help you design and implement a disaster-tolerant computing system.

Break Murphy's Law with Digital's VAXcluster MDF. When disaster strikes, your sites will be up and running instead of down and out.

For more information on the VAXcluster Multi-Datacenter Facility (MDF), call your local Digital sales representative.

NEWS FLASH

Boost Your VAX Performance with Built-in Upgrade Paths

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Protect your VAX investment and extend the life of and add value to your existing system by upgrading today.

Here's a sampling of VAX upgrade kits available:

Upgrade Kit	Order #	Price
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VAX8530 to 8550	4A-855UB-AE	$39,500
VAX8600 to 8650	4A-861UP-AE	$35,500
VAX8700 to 8800	4A-882UB-AE	$54,500
VAX8820 to 8830	4A-887UA-AE	$49,500

Note: Software license upgrades are not included in these upgrade packages.

For information on any of these VAX upgrade kits, or to order, call 800-DIGITAL (800-344-4825).

Put COHESION Conference on Your August Calendar

Get ready for a three-day summer session on Digital's COHESION environment. The conference — COHESION in a Distributed, Open Systems Environment: Developing and Managing Software Assets — is set for August 26–28, 1992, in Boston.

Cosponsored by BIS Strategic Decisions and *Software* magazine, the conference aims to provide attendees with practical plans on how to transition to an open distributed systems environment using COHESION, and to offer applications to solve specific business issues. Industry experts, including keynote speaker Carma McClure, President of Extended Intelligence, Inc., will be on hand to offer insight and expertise.

General sessions will address concerns of and encourage communication between IT senior managers and technical project leaders. Plus, an exhibit area is offered to showcase products by COHESION third-party solution vendors.

To find out more about the conference or exhibits, call BIS Strategic Decisions at 617-982-9500.

DECquery Lets You IN, DECreport Lets You *Organize*

It's the only query and reporting product set that works in a variety of databases. At the same time.

Digital's DECquery for Microsoft Windows gives you the database access you need. What's more, you can use DECquery with the MS-DOS character cell, Macintosh, and DECstation/VAXstation DECwindows Motif desktop systems.

Access Is Easy with DECquery

Through Digital's Network Application Support (NAS) services, DECquery on your desktop device puts you in touch with a full range of Digital and IBM databases, and others including VAX RMS, DB2, VSAM, and ORACLE. Plus, since a host VAX system is not required, you can gather data for PC LAN databases such as Microsoft SQL Server and Novell NetWare SQL, and local dBASE files (including dBASE-compatible databases such as Clipper and Foxbase). All you have to do is point and click with your mouse. DECquery enables you to:

- Automatically generate standard SQL queries through the use of input agents such as menus, dialog boxes, push buttons, and lists. There is no new language to learn.
- Easily extract specific information from multiple data sources and move that data to another application or to a file in any one of a number of supported formats and other vendor databases including VAX Rdb/VMS.
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Modems: Not just for data anymore

BY MICHAEL FITZGERALD
CW STAFF

Recent announcements in the modem arena show two distinct trends: Modems are faster, and they are not just for data anymore.

Products coming to market are pushing beyond the 9.6 K bit/sec. transmission rate and heading toward 14.4K bit/sec. More combine fax capabilities with the standard data transmission.

Some observers said they think this trend sounds the death knell for the data-only modem.

Facing extinction

"The data modem is dead," said Richard J. Gough, business unit manager at Intel Corp.'s personal computer enhancement division. The division sells Intel's Satisfaxtion and FAXability — boards, external modems and software that combine hardware and software, including optical character recognition software and Digital Communications Associates, Inc.'s Crosstalk. Gough said he thinks 90% of all modems sold in 1995 will be data/fax modems.

Others said they think this prediction writes off the data-only modem too early in the game.

"Data/fax is certainly a trend, but 90% of the market is pretty aggressive," said Jeremy Duke, an analyst at Dataquest, Inc., a market research firm based in San Jose, Calif. According to Duke, data/fax capabilities have tended so far to be an add-in board technology and only recently have spread to external modems and the portable market.

"When fax servers start to spread, in the next six to 12 months, you'll start to see [more data/fax modems]," predicted Marshall Toplansky, vice president of marketing at Skokie, Ill.-based U.S. Robotics, Inc., a maker of both data and data/fax modems. "But I still don't see the data-only modem heading for the scrap heap: You'll still have mission-critical applications using data-only modems."

Most data communications managers whom U.S. Robotics talks to remain purists for modems that handle important data applications, according to Toplansky.

Bright future

Still, the data/fax combination seems to be a trend. International Data Corp. analyst Judith Rosall projected the market for data/fax boards will grow at a 54% compounded annual rate between now and 1995 — though the rate will slow after 1992's $424 million to a projected $623 million in 1995.

The speed of data transmission has also greatly increased. Analysts agreed that a 9.6K bit/sec. data transmission rate has become the entry level for people buying modems today, and the high end is moving to V.32 bis modems running at 14.4K bit/sec.

Toplansky said U.S Robotics is bracing for the next level — modems compliant with the emerging V.fast standard under discussion within the Cooperative Committee for International Telephony and Telegraphy. This will allow data to be transferred at a rate of 24K bit/sec. and compression rates of 150K bit/sec. to be achieved. Toplansky predicted these modems would be on the market in 12 to 18 months. Motorola, Inc.'s Codex division has announced a V.fast modem based on the standard under discussion.

Credit card modems

As modems get faster, they also get smaller. AT&T's Paradyne subsidiary announced recently that it will build a 14.4K bit/sec. modem that meets the Personal Computer Memory Card International Association (PCMCIA) standard.

The PCMCIA standard allows for credit card-size peripherals that are just millimeters thick. PCMCIA modems on the market support only 2,400 bit/sec. rates, but the Paradyne modem will be capable of supporting a rate of 57.6K bit/sec. Paradyne officials said they expect to ship the product in August. The PCMCIA standard may be a step toward a time when modems are put on chips and built onto a computer's motherboard, analysts said.

Paradyne's V.32 bis *credit card-size modem*

Unisys adds host-LAN links

BY THOMAS HOFFMAN
CW STAFF

Unisys Corp. A series mainframe users seeking connectivity between their mainframe environments and local-area networks were given a leg-up recently when the Blue Bell, Pa., computer maker released Mark 4.0 of its Master Control Program/Advanced Systems (MCP/AS) mainframe operating system. The updated software provides LAN-to-mainframe interoperability as well as remote printing capabilities.

"One of our primary thrusts is to completely implement open systems technologies to the A series," said Bill Maclean, program manager of A series software and networking at Unisys.

Mark 4.0, unveiled at the European Unisys Users Association conference in Amsterdam, offers two distinct Novell, Inc. LAN server capabilities, according to Maclean. The Host/LAN connection links a standard Ethernet LAN into an A series mainframe. The second interface, the LAN/Connected workstation, connects personal computer and workstation users on a LAN into the CP 2000 communications subsystem.

Added interoperability

PC and workstation users are directly connected to the mainframe through the communications subsystem; data received by these users appears as native components in a Novell LAN.

Analysts said mainframe vendors are starting to become more aggressive in offering this type of interoperability. "That's happening quite often, since the mainframes require Novell and Banyan connectivity to work with the PC LANs and networks out there," said Steve Widen, an analyst at Workgroup Technologies, Inc., a Hampton, N.H.-based market research firm.

Widen said he has seen a tendency for users to rely on their mainframes as centralized repositories of data, but the interconnectivity with LANs, he explained, is essential. "You want to do a lot more than just file transfers; you need the true distributed computing capabilities," he added.

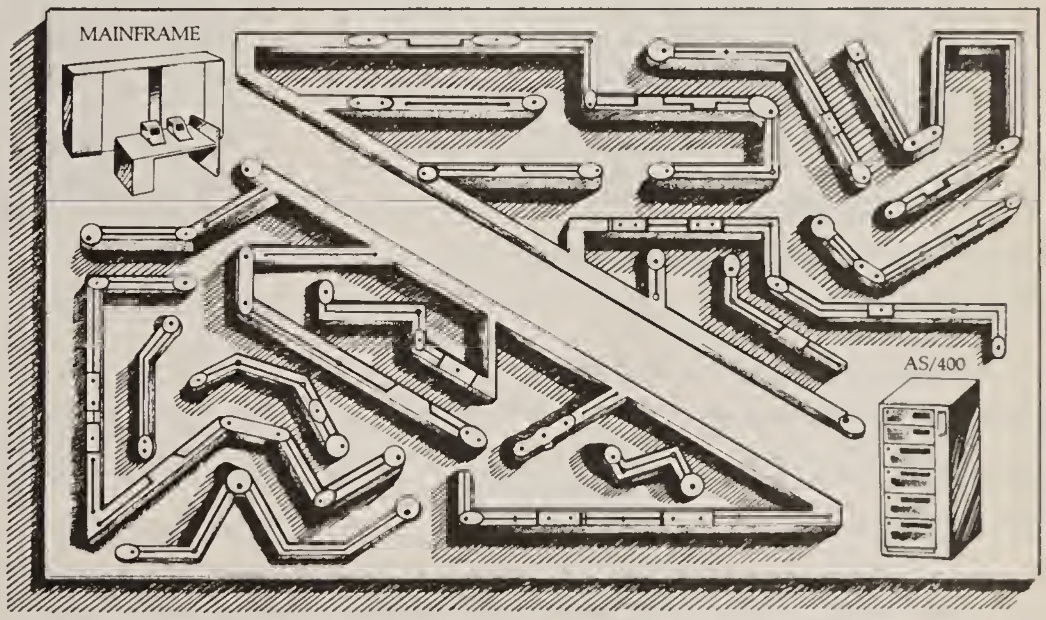
Maclean said Mark 4.0 adds some of those capabilities, such as virtual file services and virtual printer services.

Most Unisys A series mainframe users also work with Novell LANs, Maclean added, which means that to use the Mark 4.0 release, they must simply disconnect their existing communications interface and replace it with an Ethernet interconnection.

Laser connections

A number of other features in Mark 4.0 are geared toward laser printer connectivity with A series boxes, Maclean said. New capabilities were added to the print subsystem for font matching, color printing and full and partial printing, whether for host-based printers or LAN-based printers. Mark 4.0 can also support remote printing for wide-area networks.

Mark 4.0 will be available for all A series MCP/AS systems in the third quarter, with the exception of the new A11 series models, which will be made available in January 1993. Prices for new products released with MCP/AS Mark 4.0 vary according to the power of the A series host system.



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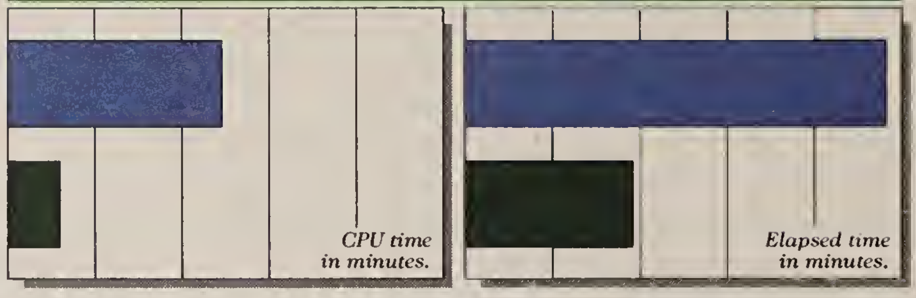

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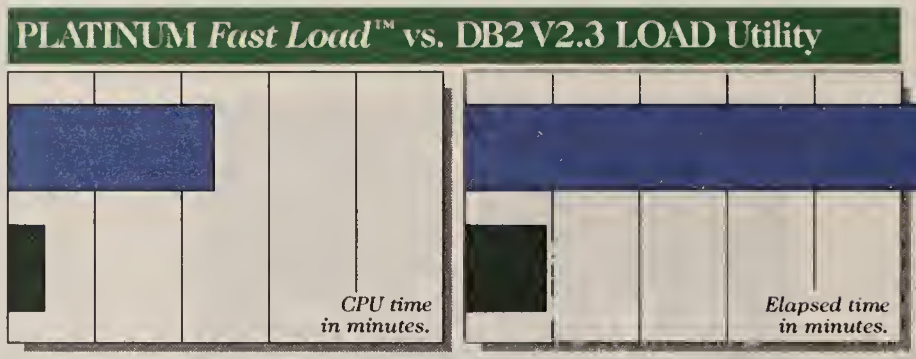

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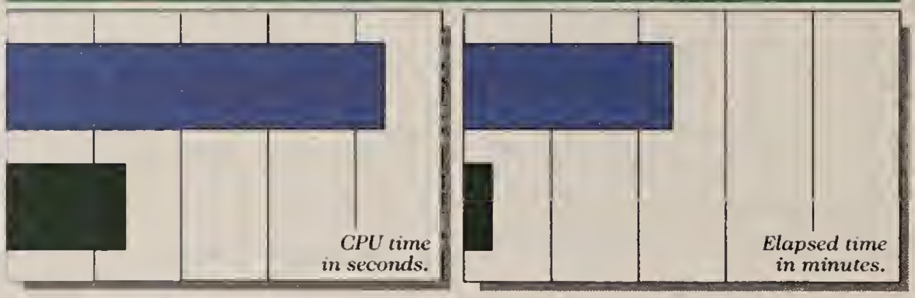

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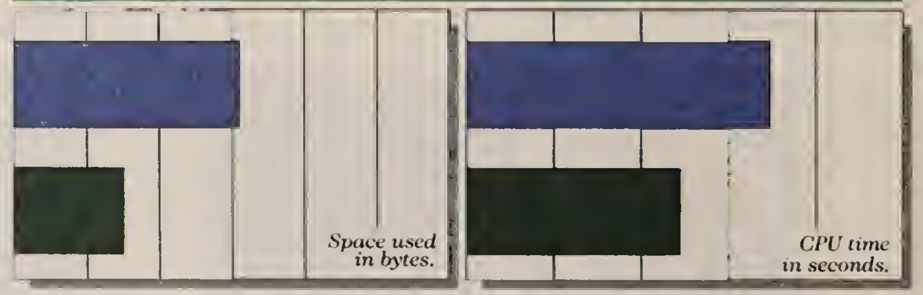

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Trials run using DB2 V2.3 General Availability release of 10/24/91 *DSN8HUFF, provided as source code with DB2 V2.3

VAX line wins cost study battle against AS/400s

BY MARYFRAN JOHNSON
CW STAFF

Price cuts and performance boosts during the past year have dramatically changed the cost of the ownership scenario for Digital Equipment Corp.'s line of VAX 4000 and VAX 6000 systems — particularly when compared with IBM's Application System/400 midrange line, a new study claims.

In a five-year cost of ownership comparison between DEC VAXs and IBM AS/400s, market research firm Technology Investment Strategies Corp. (TISC) declared DEC the price/performance winner.

"Even though DEC charges more for the software and the maintenance, the hardware is cheaper and the AS/400 comes out relatively expensive in comparison," said Bill Sines, an analyst at Framingham, Mass.-based TISC.

During the past 12 months, DEC repriced and powered up its VAX 4000 line and also boosted the performance of its VAX 6000 line with the new 600 models. IBM came rolling out with new AS/400 E models during that same period, but they still lost ground to the VAXs, Sines said.

Dubious Big Blue

IBM took issue with the study, however. An IBM spokesman said last week that TISC's comparisons were unfair to the AS/400 because in real customer situations, IBM would propose lower price models against the VAXs used for the study.

At one IBM customer site in the Northwest, for example, an AS/400 E50 was benchmarked against a VAX 4000 Model 500. While the machines ran at equivalent performance levels, IBM said its AS/400 emerged with a lower cost of ownership than the VAX.

"Figuring cost of ownership is an art, not a science," depending on the variables analyzed in such comparisons, the spokes-

Continued on page 77

IBM vs. DEC

Cost of ownership figures for key DEC VAX systems are more attractive than IBM's comparable AS/400 models in this study

Fully configured five-year cost of ownership

Systems	AS/400 E35 VAX 4000-200	AS/400 E70 VAX 4000-500
Configuration assumptions	70 workstations 4G bytes disk 64M bytes memory	300 workstations 12G bytes disk 128M bytes memory
IBM	$218,986	$946,294
DEC	$179,467	$552,845
DEC advantage	18%	42%

Source: Technology Investment Strategies Corp.

CW Chart: Michael Siggins

Lights-out dimming as IS goal

Firms recognize that full automation will not satisfy their varied needs

BY JOHANNA AMBROSIO
CW STAFF

Lights-out is no longer the all-encompassing industry buzzword it once was, users and observers say. Instead of being a goal unto itself, lights-out operation is now considered the by-product of a more holistic approach to data center management.

Then and now

Lights-out operations goals are similar, but the road map to get there from here has changed

Five years ago: Lights-out envisioned as a dark data center with no people and with computers essentially running themselves.

Today: Lights-out seen as a way to run several data centers from one remote location. That one place can be separate from any of the data centers. People remain in the picture, but only at that one control site with occasional trips to the data centers.

What stays the same: Users view lights-out as a way to save money, resources and head count — or to move people from operations into applications programming.

CW Chart: Janell Genovese

"I don't know that lights-out is the goal of the industry anymore," said Bob Kivi, a consultant at CAP Gemini America in Canoga Park, Calif. "As processing requirements change, traditional approaches to automation change."

Rather than attempting to automate everything in sight and having as the end point a totally darkened data center that pretty much runs itself, an increasing number of users are trying to manage all their data centers from one central location. That location may or may not be a data center.

About 35 of the largest U.S. companies are actually running their data centers in that fashion, estimated Jeff Schulman, an analyst at Gartner Group, Inc. in Stamford, Conn. The rest are moving in that direction, he said.

Bob Kretz, vice president of operations and services at Baxter Healthcare Corp. in McGaw Park, Ill., said, "That is where we're trying to go, but we're not there yet." He said that with the automation currently in place at Baxter, including tape silos and expert system front ends that help operators respond to error messages, 16 people have moved out of the data center. Some were temporary employees; others were moved into other information systems-related areas.

Those steps have contributed to reduced costs for Baxter, Kretz said, with the average cost to sell an item dropping from $1.60 in 1987 to $1.02 now.

Although a large number of products are available from various vendors to help automate the data center — among other functions, they reduce the number of messages that console operators must look at and even suggest actions to take for various problems — there is still not one product set that automates everything for every major brand of computer hardware and software.

Another issue is the age-old bugaboo of personnel — where to move the people who are displaced from the various data centers by automation and how to train them for their new jobs.

Peter Baas, manager of computing services at Canadian Utilities Ltd. in Edmonton, Alberta, said that when his company automated its data center, the 16 employees were dispersed to other IS departments, including development. Five relocated in the print department, which was outsourced.

"We had to guarantee jobs to all the people to gain their support," Baas said. "When we started this two years ago, we started hiring operators with the required education to do systems development."

The data center now pretty much runs itself, although a staff member is still needed to take tapes out of the silo daily. "You can get close, but there are some limitations," Baas said.

David Caddis, director of automated systems management solutions at Candle Corp. in Los Angeles, said data centers of the future will require "a different breed" of employee, more like air traffic controllers. "They will watch the screens in secured areas and require a higher skill level to use technology to make critical judgments," he said.

The print shop seems to be especially tough to automate completely. James Blackwell, director of computer operations services at Century Telephone

Continued on page 77

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SAS unveils products, graphics support

BY GARY H. ANTHES
CW STAFF

HONOLULU — SAS Institute, Inc. let some 2,500 users preview several products and product strategies at its 17th annual user group conference here recently.

The Cary, N.C.-based company demonstrated developmental versions of SAS/Trader, which collects and displays real-time financial data from markets that trade stocks, bonds, commodities and other financial instruments, and SAS/GIS, a geographic information system for displaying and analyzing spatially related data. SAS said it could be at least two years before the products are generally available.

In a statement detailing its desktop computing strategy, SAS encouraged its customers to adopt a graphical computing environment, and it reiterated commitments to support the major graphical desktop environments, including IBM's OS/2 2.0, Microsoft Corp.'s Windows 3.1 and Unix. SAS said the desktop accounted for 40% of new SAS licenses in 1991, up from 18% in 1990.

SAS also provided some guidance in choosing a graphical environment. For applications requiring connectivity to enterprisewide resources, SAS recommended OS/2 versions of its products for the desktop.

Stand-alone suggestion

For stand-alone personal computer applications needing a migration path from DOS, SAS suggested its Windows-compatible products, which will be available later this year. "This environment is best suited for . . . users that do not require the disk space and memory that a robust operating system such as OS/2 provides," said Barrett Joyner, director of U.S. sales and marketing at SAS.

SAS said Unix is the environment of choice for numerically and graphically intensive applications when I/O-intensive portions can be processed on a host. "RISC-based environments provide the best price/performance with cross-system connectivity and communications," Joyner said.

SAS announced plans to beef up its existing support for Digital Equipment Corp.'s Network Application Support strategy. It said it will fully support the Open Software Foundation's Motif using the X11R4 tool kit and widget set and will ship an enhanced All-In-1 version of the SAS System with an access method supporting the File Cabinet syntax for specifying document names in SAS.

SAS also said it will include additional support for mixed text and graphics using Compound Document Architecture, interfaces to enterprisewide system management via DECmcc and expanded support for the Common Data Dictionary. Additional research is being done in support of multiapplication message-passing, data cut-and-paste and hyperapplication support, the company said.

SAS announced the availability of JMP Design, a companion to JMP software, SAS' statistical visualization product for Apple Computer, Inc.'s Macintosh. JMP Design provides tools for designing experiments and is priced at $295.

Educational discounts

SAS said it will boost the discounts it now offers academic institutions from between 40% and 60% to between 89% and 96% for first-year licenses and 84% to 93% for renewals. The discounts are available for schools using the Unix versions of SAS products primarily for teaching and research.

SAS announced it has set up an Internet mailbox, "support@sas.com," for users wishing to contact SAS' technical support staff by electronic mail. To use the mailbox, one must be a registered SAS consultant or SAS user representative.

At the opening night of the user conference, held two weeks ago, SAS presented MCI Communications Corp. with its first annual Enterprise Computing Award for excellence in the use of information technology to achieve business objectives. Citing MCI's Operations Enterprise Model for making information universally available, Peter Olson, MCI vice president of systems planning, said, "What makes MCI's Operations Enterprise Model distinct is that it places as much focus on behavior change as it does on information technology."

"This is the kind of strategy that has the greatest possible impact on organizational goals," said James Goodnight, SAS' president. "MCI's vision will be the standard for information technology in the '90s."

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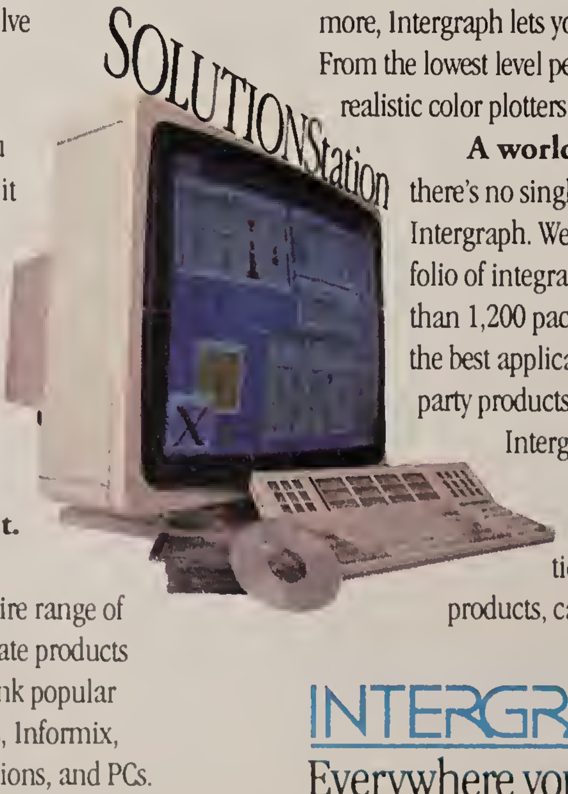

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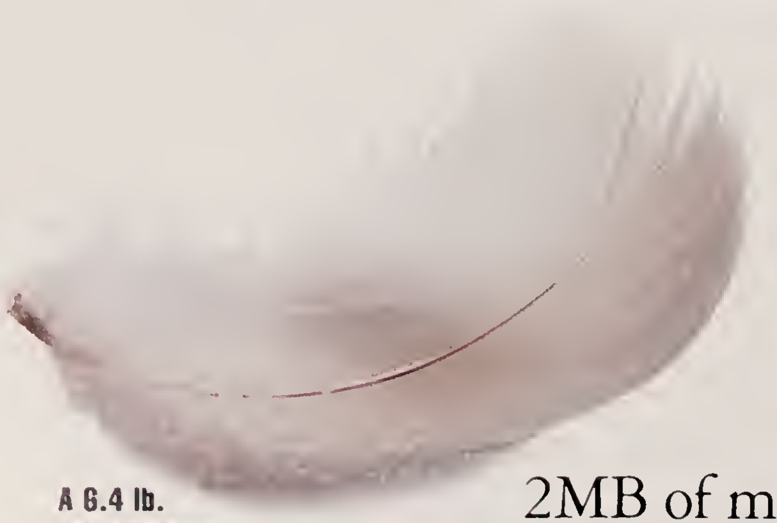
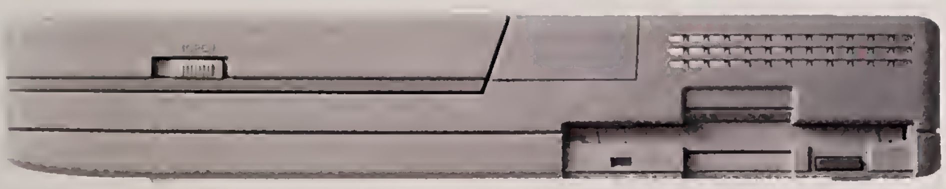


A 6.4 lb. featherweight that packs a 20 MHz punch.

With an i386sx, 20MHz processor, 2MB of memory (expandable to 8MB) and a 40MB (optional 80MB) hard drive, the 320P Notebook packs all the punch of much larger PCs. So you can use your fancy footwork far from your office—without sacrificing computing power. And because the 320P Notebook comes preloaded with DOS 5.0



and Windows 3.0, you're ready for action.

So keep moving. Our 320P Notebook's NiCad battery has a 3+ hour capacity to help you go the distance. An easy-to-carry AC power supply boosts energy between rounds. And a special Auto-Resume feature spares you the aggravating lag time of having to reboot—and keeps your guard up when you're switching power sources!

A 3+ hour battery life for those extra-long bouts.

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Please reference ANH when you call.
Mon-Fri 8:30am to 8:00pm (ET)

The DECpc 420sx

Every i486-based system to come along stakes a claim to the heavyweight PC title. But as the saying goes, the bigger they are, the harder they fall.

That's why Desktop Direct from Digital built a 20MHz i486sx system that's lean enough to be affordable (at $2,399) and mean enough to deliver a knockout blow.

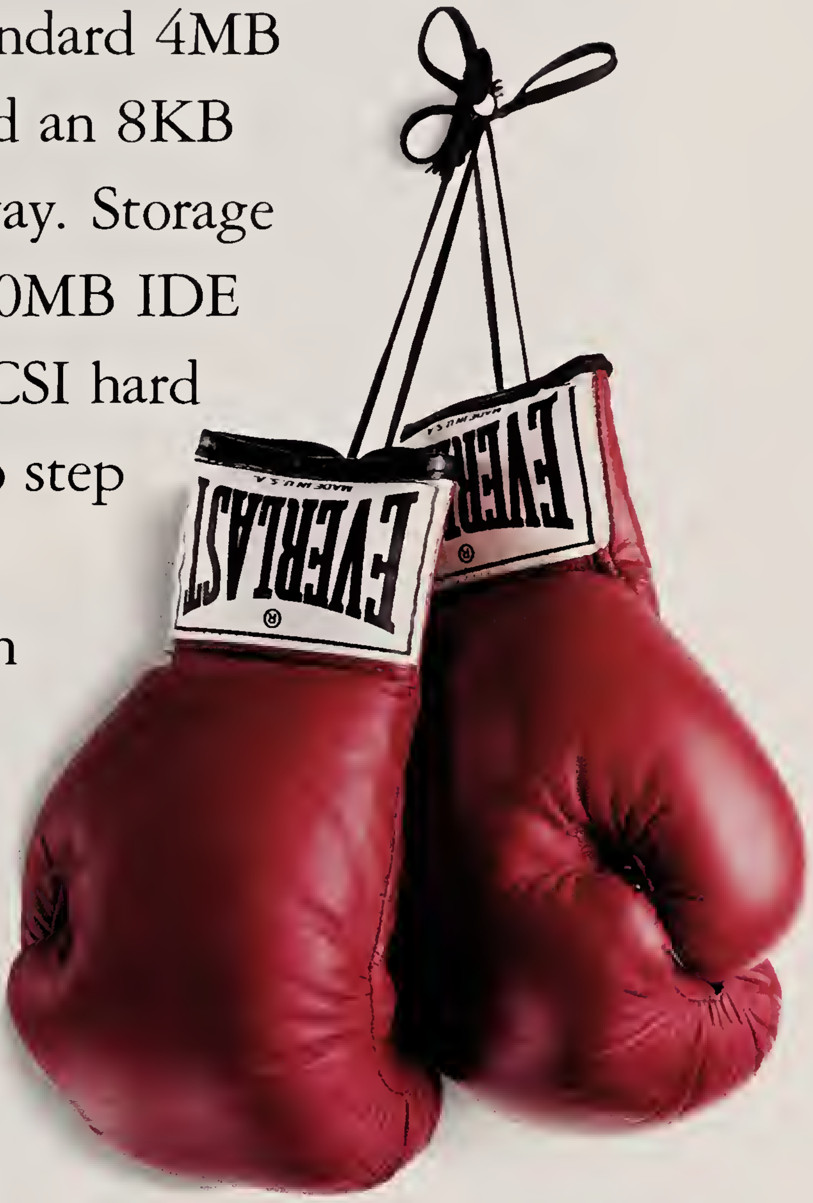
Besides support for 32MB memory, the 420sx packs a punch that hits you right between the eyes: state-of-the art, non-interlaced video technology for 1024 x 768, 256 color graphics.

And because Digital's engineers are always in training, they designed the 420sx to have every possible competitive edge in PC prizefighting. One

DESKTOP DIRECT 48 HOUR TURNAROUND

example: all components–including the video and memory–are installed on the main logic board. That means better performance without higher prices.

What's more, the 420sx is always ready to step up to a real heavyweight challenge. Its standard 4MB of memory is expandable to 32MB, and an 8KB memory cache is constantly jabbing away. Storage options include 52MB, 105MB and 120MB IDE hard drives and 209MB and 426MB SCSI hard drives. That's just the bulk you need to step into the ring with the big guys. And of course, the 420sx comes preloaded with DOS 5.0 and Windows 3.0–so you're ready for a workout right away.



As with all Desktop Direct products, the 420sx is backed by our 30-day money back guarantee and our one year, on-site, no fine print warranty–at no extra charge. So you can rest assured that no matter how tough your challenge, the world's second largest computer company is always in your corner.

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TECHNICAL

The **DEC**pc 320P Notebook

Includes:
Microprocessor: Intel i386sx running at 20MHz
Memory: 2MB
Storage: 40MB IDE Hard Disk Drive
3.5″ 1.44MB Floppy
Display: TST Backlit VGA
Modem: 2400 bps Data
Keyboard: 84-key
Mouse: Logitech™ TrackMan® Portable
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0 (factory installed)

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The **DEC**pc 316sx

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Display: 14″ Multi-sync VGA Color Monitor
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Storage: 105MB IDE Hard Disk Drive
3.5″ 1.44MB Floppy
Video Adapter: 1024 X 768 VGA with 512KB of video RAM upgradeable to 1MB to support 256 colors
Display: 14″ Multi-sync VGA Color Monitor
Keyboard: 101-key
Mouse: Three-button
Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

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Display:	TST Backlit VGA
Modem:	2400 bps Data
Keyboard:	84-key
Mouse:	Logitech™ TrackMan® Portable
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FR-PCP11-FA

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The **DEC**station™ 320sx

Includes:

Microprocessor:	Intel i386sx running at 20MHz
Memory:	2MB, 80ns Memory Kit
Storage:	52MB IDE Hard Disk Drive 3.5″ 1.44MB Floppy
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Display:	14″ Multi-sync Color Monitor
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Memory:	8MB, 70ns Memory Kit
Storage:	40MB IDE Hard Disk Drive 3.5″ 1.44MB Floppy
Resolution Mode:	1280 X 1024 TIGA Adapter
Display:	20″ Color Monitor
Keyboard:	101-key
Mouse:	Three-button
Operating Systems:	MS-DOS 5.0 and MS-Windows 3.0

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☐ DECpc i486 and i486sx based systems
☐ The DECpc 320P Notebook
☐ The Catalog

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Customization Worksheet

Your base system is a: ☐ 286 ☐ 386 ☐ 486 ☐ Other

How many applications will your PC(s) run in a typical workday?

What best describes the type of work the system will be used for? (Check all that apply)

☐ Word Processing
☐ Order-entry
☐ Database (filing records)
☐ Financial Calculations
☐ Retail Store Management
☐ Desktop Publishing
☐ Education
☐ Design (CAD/CAM)
☐ Engineering
☐ Industrial Process Control
☐ Scientific Research
☐ Software Development
☐ E-Mail
☐ Other industry-specific applications (please specify)

How many people work in your group, department or small business?
☐ Less than 10 ☐ 10-20 ☐ 20-35 ☐ More

Is your operating system:
☐ DOS ☐ DOS with Windows ☐ OS/2 ☐ MAC ☐ UNIX™ ☐ Other

Which of the following graphics-oriented applications best describes your needs? (Check all that apply)

☐ Desktop Publishing
☐ CAD/CAM
☐ Realtime Modeling
☐ Animation
☐ Image Processing
☐ AutoCad
☐ Business Graphics

LAN Communication

How many PCs do you have installed? From how many manufacturers?
What kinds of connections does your PC(s) require? (Check all that apply)
☐ Links with other PCs in the immediate surroundings
☐ Connection to the local area network (LAN) throughout a building
☐ A line to a host system in a remote location
What kind of media (cable) is used in your LANs today?
What is the networking software now being used in your company?
What kind of host system will your PC communicate with?
☐ DECpc ☐ IBM ☐ Other

What Kind of Service Do You Really Need?

☐ On-site Hardware Support ☐ Software Support ☐ Telephone Support
☐ Training ☐ FAX Hotline

How many of your users take portables on the road?
Do you currently have a service contract(s) for your PCs? How many?

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HP wins Czech job

BY MARK HALPER
CW STAFF

PRAGUE — Showing that vendor independence is not always the key to winning systems integration deals, Hewlett-Packard Co. has landed a $10.5 million contract to automate the Czech Republic's new private health insurance company.

The selection of a vendor as the lead contractor was a foregone conclusion, as the client, Universal Health Insurance Co., requested that a hardware company play the lead role, according to Michel Massain, government account manager for HP Europe's East Central Europe operations.

HP Czechoslovakia beat IBM, ICL and Siemens Nixdorf Information Systems, Inc. for the deal, which calls for 80 HP 9000 Series 800 minicomputers running the HP/UX Unix operating system to be installed at 78 sites. Three machines will be housed in central operations in Prague, while each branch office will receive one 9000.

Global effort

HP's integration team includes project manager Cap Gemini Sogeti in Paris, database supplier Oracle Corp. and a Prague software house, APP Systems. APP is developing insurance software linked to Oracle's Version 6.0 database, Massain said.

The system is intended to automate record keeping, premium collection and claims payments for 10 million people.

A pilot installation has been on-line in Prague since February, and the whole system is scheduled to be up and running by the end of this year, according to Massain.

Universal Health Insurance was formed in January as part of Czechoslovakia's privatization drive. Health care previously was supplied free by the state. Universal, which serves the Czech Republic but not Slovakia, estimates it will process 130 million documents per year.

Although Universal requested a scanning system, it turned down HP's scanner proposal in favor of saving money by using scanning equipment already owned by Czechoslovakia's Ministry of Privatization, according to Massain. The scanners will digitize written data from paper forms at each Universal office.

HP had proposed its own Advanced Image Management System Software with Fujitsu Ltd. scanners. A Rotterdam-based integrator, Document Access, was to have developed the ties between the Fujitsu scanner and the 9000.

IN BRIEF

Conrail on track with $25M data center, IS consolidation

■ **Consolidated Rail Corp.** recently broke ground for a new $25 million data center in Philadelphia that will house mainframe and communications equipment from two centers slated for consolidation. The new facility, expected to be finished by the end of the year, will employ Conrail's 200 information systems workers. Robert Wagner, who came on board as vice president of IS in June, said the center will be designed to accommodate the freight carrier's growth for the next decade.

■ As word spreads that the payback from bar-code systems can be swift, sales of the equipment and services are expected to grow "briskly," according to **Venture Development Corp.**, a Natick, Mass.-based consulting firm. The firm predicted annual revenue growth to average 17% for the next four years.

■ Printer maker **Dataproducts Corp.** in Woodland Hills, Calif., elected a new chief executive. Irvin Maloney, who was named president and chief operating officer in September, replaces Jack Davis, who will continue as chairman.

■ **Siemens Nixdorf Information Systems, Inc.** also named a new president and chief executive. Adriaan Pieters will replace Albert Holler, who remains on the board and will advise the Burlington, Mass.-based company in strategic partnerships.

■ **Xerox Corp.** said Chess, a set of open systems manufacturing applications, is now available for **Digital Equipment Corp.**'s Unix-based DECsystem hardware. Xerox said future plans are aligned with DEC's plan for an operating system that is based on the Open Software Foundation's OSF/1.

■ **Structural Dynamics Research Corp.** announced a pact with **Mentor Graphics Corp.** that lays down a migration path for users of Mentor's computer-aided design ME/Design and ME/AutoSurface packages to software jointly built by the two firms. The co-developed applications will contain electronic and mechanical components.

■ **Prime Computer, Inc.** said that in addition to systems from Sun Microsystems, Inc., **Computervision Corp.**'s Computer-Aided Design and Drafting System 5 (CADDS 5) users will be able to run the computer-aided design and engineering software on Unix boxes from **Digital Equipment Corp.** Other products from Computervision, the Prime unit that sells computer-aided design and manufacturing software, already run on DEC's Unix-based DECstation 5000 reduced instruction set computing machines, including Medusa and Calma. CADDS 5 for DEC, priced between $1,500 and $25,000, is due out this summer.

■ Files created in the proprietary **Wang Laboratories, Inc.** VS minicomputer environment can be converted to Borland International, Inc. dBase-compatible documents using Move-It File Utility, a new tool from **Green River Software, Inc.** in Hendersonville, N.C. The local-area network-based, multiuser package is targeted at developers who create and integrate applications for use in mixed VS and DOS environments. The price is $1,595.

■ Memory systems for **Data General Corp.**'s Aviion systems are available from **Kingston Technology Corp.** in Fountain Valley, Calif. Memory upgrades in 4M-, 8M- and 16M-byte capacities for selected Aviion workstations and servers are priced between $1,995 and $4,995.

Lights-out dimming as systems goal

CONTINUED FROM PAGE 75

Enterprises, Inc. in Marion, La., said, "We are automating everything we can, but we still have a large print shop for our phone bills." They are essentially lights-out for the CPU and disk drive areas, he said.

Another issue is that automation can only go so far because "everyone runs their data center a bit differently, with different policies and procedures," said Joanne Esposito, a product manager at Legent Corp. in Pittsburgh.

The trends of globalization and decentralization are also changing how users automate. Schulman said there is a "very big debate" taking place at user organizations over where the central point of control should be. "Should it be centralized on the mainframe or distributed via servers? This will play out over the next few years," he said.

Semantics are also tricky. "If you pull people out of the data center and run it from somewhere else with other people, is that really lights-out?" said George Kurtz, senior consultant at Computer Associates International, Inc. in Islandia, N.Y. Whatever term is now used, he said, "The goal is to run the data center more like a business."

> THE TRENDS OF globalization and decentralization are changing how users automate.

NEW DEALS

Sequoia wins $8.5M interactive TV pact

■ **TV Answer, Inc.**, a technology developer for interactive television, recently struck a deal worth an estimated $8.5 million with **Sequoia Systems, Inc.** in Marlboro, Mass. The five-year contract, involving hardware, software, systems maintenance and services, calls for a Sequoia Series 400 fault-tolerant system to act as the main processor at the center of the first national interactive U.S. TV system in TV Answer's National Switching Center in Reston, Va. TV Answer, which plans to use the crash-proof Sequoia system to register and track consumer transactions, projects it will place 20 million consumer units during the first five years, beginning in early 1993. The units will be manufactured and marketed by Hewlett-Packard Co.

■ Pharmaceutical giant **Merck and Co.** said it is installing a **Cray Research, Inc.** Cray Y-MP 8I supercomputer at its Rahway, N.J., headquarters for use by its research division. The Y-MP 8I, introduced in March 1991, can be configured with up to eight CPUs at a price ranging from $14.2 million to $16 million. The announcement makes $8.6 billion Merck the seventh Y-MP 8I site worldwide and the 12th to devote a Cray machine to chemical research, Cray said. In all, there are 298 Cray supercomputers installed worldwide, according to Cray.

■ **Convex Computer Corp.** recently said it has shipped its 1,000th system, a Convex C3800 supercomputer delivered to Ford Motor Co. in Dearborn, Mich. The system will be used for computer-aided engineering applications at the concept level of design. It is intended to predict crash analysis, airflow simulations and vehicle system and subsystem performance, according to Ford.

VAX line wins cost study

CONTINUED FROM PAGE 75

man said. Another factor to consider, he added, is the "significantly higher residual value" of AS/400s over DEC VAXs.

"IBM claims that the AS/400 is extremely cost-effective, but cost-effective against what is the question," Sines said. "When comparing AS/400 D models to E models, it is very cost-effective. But we wanted to look at how it was doing against other products."

VAXs were singled out because of their similar positioning as midsize business computers or departmental systems in distributed office environments.

To compare costs between the two midrange lines, Sines examined each model of the AS/400 E line, from the E10 to the E90. He matched the IBM machines with similarly configured VAXs, including the VAX 3100 Model 10E and several models of the VAX 4000 and VAX 6000.

The only AS/400 to show a price advantage over a VAX was the low-end AS/400 E10, which at $73,321 had a 24% price advantage over the VAX 3100 Model 10E ($91,112) in a 25-user configuration.

One conclusion of the comparison, Sines said, was that buyers must weigh short-term benefits against long-term costs.

NEW PRODUCTS

Data storage

Emulex Corp. has announced new products in its DSSI-compatible data storage line.

The DR600 Series rack-mount tape subsystem is available in 4mm digital audio tape (DAT) and 8mm helical-scan formats. DAT capacity is up to 32G bytes, while helical-scan capacity is up to 10G bytes. Pricing ranges from $7,900 to $17,500.

The DR500 Series provides up to 4.2G bytes of rack-mount storage in one- and two-drive configurations; up to 18 of the units can be mounted in a 60-in. cabinet. Seek times are as low as 11 msec, the company reported. Pricing is from $8,300 to $21,500.

Emulex
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

Decision Data, Inc. has introduced new 4mm and 8mm digital audio tape (DAT) subsystems for the IBM Application System/400.

The 7260 single-density 8mm tape system stores up to 10G bytes of data per tape cartridge. It can be configured as a dual-drive system. Sustained data transfer rate is up to 1M byte/sec., according to the company. The 7265 dual-density model is also available.

Both versions feature single, cascade, parallel and mirror recording modes and field upgradability. Pricing starts at $6,450.

The 7240 and 7245 4mm DAT systems provide up to 5.2G bytes of storage in a dual-drive configuration. Pricing starts at $6,350.

Decision Data
1 Progress Ave.
Horsham, Pa. 19044
(215) 674-3300

Eastman Kodak Co. has created the Koday Optistar Storage System (KOSS) for IBM and compatible mainframes.

KOSS includes the Kodak optical disc system 6800 automated disc library, a controller that attaches directly to the mainframe and software for retrieving stored data. Total storage capacity can be more than 1T byte, depending on the configuration.

Pricing starts at $400,000.

Kodak
Department 412-L
Literature Fulfillment
343 State St.
Rochester, N.Y. 14650
(716) 724-6888

Utilities

Sterling Software, Inc. has created Space Monitor Release 2.2.

Space Monitor allows users to monitor, define, sort, filter and analyze current storage system information. The updated software can monitor data controlled by IBM's Storage Management Subsystem, which gives users more control over their storage environment, the company reported.

Tiered pricing starts at $18,000.

Sterling Software
11050 White Rock Road #100
Rancho Cordova, Calif. 95670
(916) 635-5535

Systems and Computer Technology Corp. has announced the release of IntelliQuest for Human Resources, a companion product to its Banner Human Resources System.

IntelliQuest is a natural language query system that allows users to access information stored in Banner via English commands.

According to the company, IntelliQuest is flexible enough to handle grammatical variations, misspellings and new words.

Pricing ranges from $10,000 to $75,000.

Systems and Computer Technology
4 Country View Road
Malvern, Pa. 19355
(215) 647-5930

Software Engineering of America, Inc. has announced Release 4.3 of PDSFAST, its mainframe data set management tool.

According to the company, PDSFAST decreases elapsed time for direct-access storage device management functions by as much as 90%. The new version adds support for IBM's Escon architecture.

Pricing ranges from $13,500 to $42,300.

Software Engineering of America
2001 Marcus Ave.
Lake Success, N.Y. 11042
(516) 328-7000

Applications packages

Camstar Systems, Inc. has launched MESA, an integrated manufacturing execution system application software system for batch process manufacturing.

MESA runs on IBM Application System/400s and includes modules for tracking and monitoring all production resources, collecting and managing data on quality and handling schedule functions.

Pricing ranges from $45,000 to $375,000, depending on the AS/400 model and number of users.

Camstar Systems
Suite 200
2105 S. Bascom Ave.
Campbell, Calif. 95008
(408) 559-5700

XEROX

They calculated that a 100% increase in business needed a 900% increase in productivity.

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Lynn L. Wells
Document Management Representative

When a major health insurer suddenly doubled its customer base, their MIS department quickly predicted disaster. The company's in-house document publishing system was already overloaded. They had to drastically cut the time it took to produce vital documents or risk the company's reputation for customer service. That's when they called Lynn Wells and the Xerox team.

Working together, they saw that merely upgrading equipment to add capacity was not the solution. So they took a fresh approach and completely redesigned the company's document publishing processes. Carefully building on existing systems, they integrated Xerox workstations, software, scanners and laser printers to create a custom publishing network.

Benefit booklets that once took forty-five days to publish now take less than five, a 900% increase in productivity. MICR-encoded checks and claims explanations are being printed and mailed together, saving $350,000 a year in postage. And forms are now created electronically, on demand, reducing costs by 30%.

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APPLICATION DEVELOPMENT

CASE • LANGUAGES • TOOLS

COMMENTARY

Judith S. Hurwitz

Keep on redeveloping

Unlike independent software developers, corporate developers don't assign version numbers to the systems they create. For some reason, in-house development teams assume that an application is written once and then simply maintained. That's a mistake.

In most traditional organizations, applications are written as though they will last forever in the form that they were created. As a result, IS departments try to program for longevity. They try to second-guess what their users will need three years from now.

However, IS organizations are starting to realize that what seemed innovative one day is outdated the next. What's the solution? Create applications with the understanding that they are temporary. Inevitably, these applications will change because the organization they are designed to automate will change.

I call this philosophy "perpetual redevelopment." Perpetual redevelopment is as much a state of mind as it is a concrete methodology. If IS management begins to think about the way applications are built and used, their assumptions and the tools they select will also begin to change. For example, if an application will change dramatically, it would make sense to build it out of small modules rather than integrated programs. If one component of an application will benefit a small group of users by helping to solve a critical problem, then a rapid application generation tool will probably be the best selection.

Why is it suddenly necessary to change the way we think about application development? As the age of the monolithic mainframe fades, so does the necessary rigidity of the development environment that was part of that world. The complexity of the mainframe environment dictated many of the programming and development practices that we took for granted as necessary evils.

Departmental users have understood for 10 years that things did not have to be as complex and cumbersome as the mainframe environment dictat-

Continued on page 81

Icon-based ease comes to database users

IntelligenceWare swaps complicated query language commands for point-and-click simplicity

BY JAMES DALY
CW STAFF

LOS ANGELES — If you are a database user who blanches every time you wrestle with a convoluted SQL command, you may be in for a break.

Next month, software maker IntelligenceWare, Inc. is scheduled to unveil Iconic Query, an application that allows users to access database information by clicking on graphical icons rather than facing an intimidating query language. The ultimate beneficiary is the end user, who sees a friendly interface when first engaging the system.

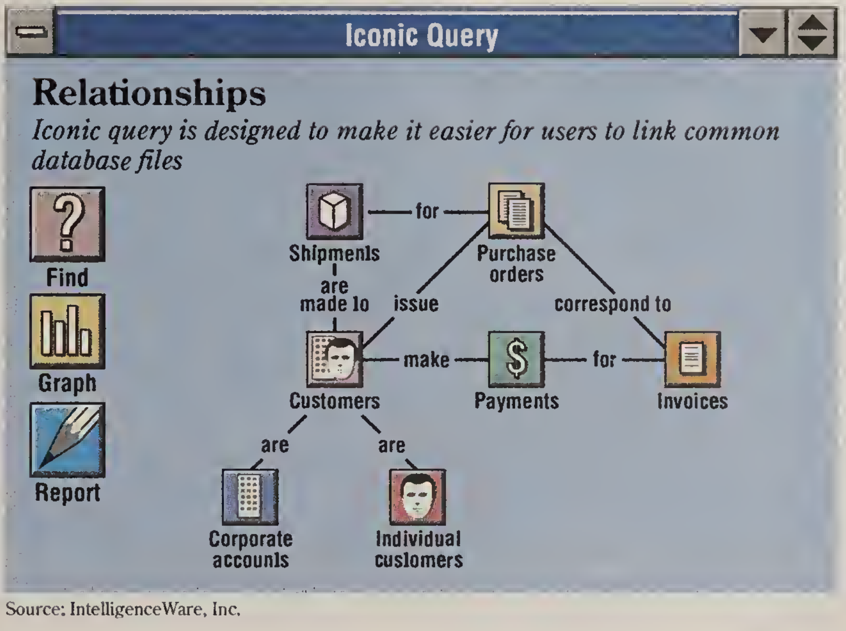
President Kamran Parsaye said the Microsoft Corp. Windows-based package, which will be available for IBM Personal Computers and compatibles and cost $290 per workstation, is a way to "break the ice between the user and the database. Icons are more intuitive to end users than [data] tables."

Open to other databases

The open architecture of Iconic Query offers read access to many commercial database systems, including Borland International, Inc.'s Paradox, Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase and IBM's DB2.

Iconic Query comes with a library of icons that can be assigned to different tables either by the end user or a central IS person. Relationships are constructed by drawing connecting lines between the icons, which have been previously assigned to tables. Click on an icon and the SQL statement is not only automatically generated but shown in a separate window. While it cannot do Query By Example, it can do range queries and Booleans.

A table of customer profiles, for example, could be linked to a table of shipping records. If users want to know how many orders for a certain item have been placed by a customer during the past year, they click on the customer icon, the shipments icon and the product icon. For example, a user would access the table of customers and then enter the customer's name.



Iconic Query

Relationships

Iconic query is designed to make it easier for users to link common database files

Source: IntelligenceWare, Inc.

The application's hypertext capability allows users to relate variables, such as terms of the sale and how the order was shipped. Double-clicking on the specified icon can create a specific relation or query to let the user browse through the contents of the database. The answer would appear in tabular form in a separate window.

More than skin deep

Iconic Query is more than just another pretty face. Behind the icons is a built-in link between the various tables. The user has full access to the joined database, getting answer reports and graphs immediately.

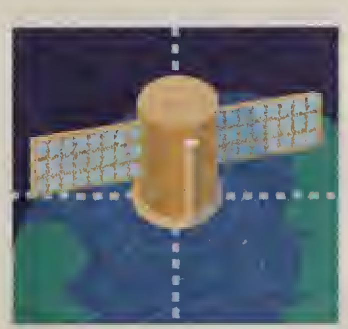
The package could also help smooth the building of corporatewide database applications. As such, it is in league with other SQL query tools, such as Gupta's SQL Windows, which are a popular way to control, centralize and update mission-critical data.

Data files from spreadsheet applications, statistical analysis programs, PC data management programs and graphics packages are applications that might be joined on such a database.

RDBMS helps prevent satellite disaster

BY CHRISTOPHER LINDQUIST
CW STAFF

In the 1970s, the Soviet Cosmos 954 satellite called a lot of attention to itself by crashing in a relatively remote section of northern Canada and releasing radioactive particles from its nuclear reactor on impact.



Preventing an incident such as this — or worse, one in which a satellite hits a populated area — is what POD Associates in Albuquerque, N.M., hopes to do with an application called Technology Hierarchy for Orbital Recovery, or THOR. THOR is a relational database built with Software Publishing Corp.'s Superbase database for Microsoft Windows, which allows scientists to develop recovery and disposal scenarios for nuclear-powered satellites.

The database contains large amounts of information, collected from manufacturers and other sources, on various technologies related to the satellite recovery efforts, including detailed data about launch sites, recovery vehicles, reactor composition and satellite size and mass. Scientists use pull-down menus to input information such as type of satellite, type of reactor powering it and whether the reactor is operating; THOR returns possible solutions for the recovery. Using the information stored in the database file, THOR can present a detailed recovery scenario, including what type of recovery vehicle to use and where to launch it from.

In the past, this job was usually performed by hand using a complex matrix, and it depended on the scientist's being aware of all the various options for each recovery. Now the scientists can use pull-down menus to design a scenario. "After everything is set up, THOR goes and does all the calculations for you," said Samantha Lapin, a research engineer at POD. Scenarios that used to take weeks or months can now be performed in minutes.

THOR is expected to be completed by the end of the year, assuming government funding comes through as expected. And more technologies still need to be added to the database file. But once finished, Lapin said, THOR should save organizations such as NASA, the Department of Energy and the Department of Defense a person-year's worth of effort, equaling $100,000 to $200,000.

CASE/4GL tool updated

BY SALLY CUSACK
CW STAFF

LOMBARD, Ill. — Michaels, Ross & Cole Ltd. has announced a new version of its mrc-Productivity Series 4GL/CASE tools for the IBM Application System/400 community.

Version 3.2 reportedly provides several additional tools for application developers, programmers and end users. These include Microsoft Corp. Windows-based tools to provide access to data dictionary information, enhanced report-writing capabilities and AlphaCalcs, a function designed to allow users to format character strings through simplified concatenation and substring operations.

According to the vendor, the AlphaCalcs feature is based on IBM's recent RPG/400 enhancements and will make it easier for nontechnical users to create multimailing labels and name/address spacing applications.

While these features are useful, the number of RPG users is small compared with the number who use other commercial languages, said David Sharon, president of CASE Associates, Inc., a market research and consulting firm based in Oregon City, Ore.

Version 3.2 of the mrc-Productivity Series is slated to be available May 15 and costs from $2,000 to $59,000, depending on the AS/400.

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Hurwitz

CONTINUED FROM PAGE 79

ed. But power in corporations was firmly in the hands of the mainframe-oriented managers. So, no matter what these departmental users were able to achieve, it was never accepted by mainstream IS environments.

However, the rapid movement away from the mainframe has meant that applications have had to move onto less expensive servers. As these systems move downstream, it is inevitable that there are more tools available to make the applications development process easier and faster. Because the cost to enter non-mainframe software markets is so low, users and IS managers will increasingly find a wealth of tools that will help make the dream of perpetual redevelopment a reality.

Does perpetual redevelopment mean throwing out structured planning methods? No. What it means is that applications should be built as smaller component parts that can be linked together. Make no assumptions about what business requirements will be like in two years. Trust me — they will be different.

> PICK A NEW project and design it with perpetual redevelopment as the goal.

The only assumption you should make is that things will change. If applications are designed with this flexibility, it will be much easier in two years to add modules to an application without disrupting viable parts of applications.

Am I advocating that users rapidly move to object-oriented application development methods and languages? The answer is yes and no. For many users with traditional programs, programmers and systems in place today, making such a huge leap into foreign territory is too great a risk. On the other hand, organizations must begin to restructure their applications so that they can eventually become part of this flexible systems infrastructure. Even a traditional Cobol programmer can be taught to write modular programs that are geared to solving a single problem.

Therefore, my advice to IS organizations is to begin making the transition away from thinking of software as though it is a bunker built of concrete and able to withstand even an atomic blast. The bunker may be good protection in the event of a disaster, but it lacks the flexibility to change as events change.

IS managers should spend time with PC developers in their user departments. Notice how quickly they change their applications and ways of working when they find a technique or program that helps them get the job done. Pick a new project and design it with perpetual redevelopment as the goal. With the wealth of new tools flooding the market, the time is right to start redefining what it means to develop applications.

Hurwitz is president of Hurwitz Consulting Group, a Newton, Mass., company that publishes "Tool Watch: Enabling Open Applications Development" and "Media Letter," a monthly newsletter about multimedia tools and trends.

CASE tool maker claims object-oriented scoop

BY KIM S. NASH
CW STAFF

CHICAGO — An application development tools firm quietly unveiled a new component of its flagship product amid the Comdex/Windows World Spring '92 hoopla here recently, claiming it sports the kind of object-oriented features major CASE companies still have on their drawing boards.

System Architect, a front-end computer-aided software engineering (CASE) tool from Popkin Software and Systems, Inc., will support object-oriented techniques formulated by development gurus Ed Yourdon and Peter Coad, according to a spokesman for the New York-based company.

Little guy first

With the $495 analysis and design module due out in June, Popkin beats larger, more established CASE makers to the punch, according to Martin Garvey, research analyst for application development strategies at Meta Group, Inc. in Westport, Conn.

"The big guys aren't very far along at all with object-oriented [tools]. If Popkin can make this work, it could help them grow quite a bit," Garvey said.

Texas Instruments, Inc., Andersen Consulting and KnowledgeWare, Inc. have each promised to incorporate object-oriented features in their CASE life cycle but have so far produced "nothing in the way of product," Garvey added.

The new version of the System Architect module, which was scheduled to start beta tests last week, has been upgraded to support Booch91, the latest development method from object-oriented advocate Grady Booch. The tool previously supported Booch88, which is specific to the Ada language. Booch91 includes software building techniques specific to SmallTalk, Object Pascal and C++.

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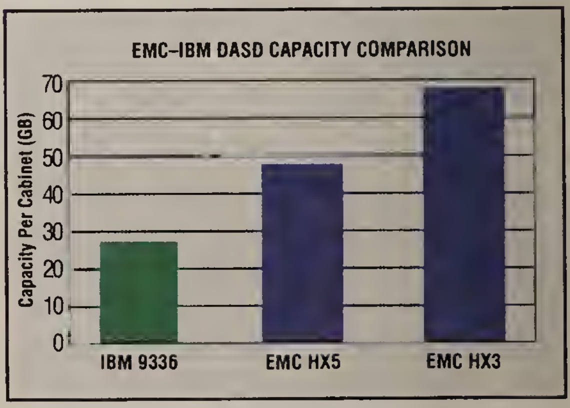

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The New Centralization

Thanks to tight budgets, re-engineering, wild networks and overwhelmed users, centralized control is making a modest comeback — with a twist

Alan Levenson

Yamaha's Scharff: *In the emerging client/server environment, central IS will handle database and LAN management, communications standards and security*

BY JOSEPH MAGLITTA
AND MARK MEHLER

One year ago, IMS America, a market research firm, wanted to improve compatibility among the divisional programming groups that had sprung up in the wake of its many strategic acquisitions in the 1980s.

So the company, a unit of IMS International, Inc. and a wholly owned subsidiary of The Dun & Bradstreet Corp., united its worldwide development groups under a single information systems organization. The goal was to ensure uniformity of applications and reduce redundancies.

"We need to develop core applications that bridge worldwide geographies and cross-match data," explains Stephen Engber, vice president of data processing development. "That can't be done within a decentralized model."

After nearly a decade of steady decentralizing, some U.S. companies are now exploring ways, particularly recentralizing, to reduce duplicated efforts, establish standards and maximize companywide technology spending.

In recent months, J. P. Morgan Services, Metropolitan Life Insurance Co., Manufacturers Hanover Trust Co., Unum Life Insurance Co. and others have moved to improve corporate computing performance by increasing central IS control. Some are still studying; others have acted. These companies join International Paper Co., Dillard Department Stores, Inc., The Principal Financial Group, General Electric Co.'s Telecommunications Co. and others that have already recentralized in part or completely.

No one is predicting a halt to the widespread trend of combining centralized and decentralized computers and networks. But analysts and IS managers say the new attention being given to centralization shows that the transformation is not as straightforward as many had expected and that distributed computing is not a simple cure-all.

"User empowerment is apple pie and motherhood," says Howard Anderson, managing director at Boston-based The Yankee Group. While decentralization always sounds good in theory, Anderson says, the reality is often less pretty.

In many companies, he says, "Divisions were off buying software like drunken sailors. The best practices and security suffered." For example, very few divisions back up data every night, according to Anderson. "It became amateur night."

Restoring order from chaos

But the path back to greater central control is tricky. Since the personal computer revolution of the early 1980s, many firms — by design or default — have pushed computing power into business units. Many are discovering, however, that along with benefits, distributing computing can also cause chaos, redundancy and confusion.

As a result, many top IS executives must now try to reestablish control while respecting the fiercely prized autonomy of local business units.

Manufacturers Hanover, for instance, is taking a fresh look at how to best deploy its computing and networking resources. Now in the middle of a megamerger with Chemical Bank Corp., the New York giant will likely create a combined IS department that mirrors the old "Manny Hanny"

Continued on page 86

Maglitta is a *Computerworld* senior editor, features. Mehler is a free-lance writer based in Jackson Heights, N.Y.

Power Shifts

KEY POINTS

▶Some U.S. companies are recentralizing selected functions in hopes of reducing duplicated efforts, promoting standards and stretching their firms' technology dollars.

▶Analysts say the new interest in centralization is a step in the evolution of IS from a "traffic cop" to an "information utility."

▶The biggest challenge facing IS executives is to assert control while respecting the autonomy of business units.

▶IMS America united its worldwide development groups under a single IS organization. Manufacturers Hanover is considering centralizing its data center and systems development while pushing maintenance to business units. Unum Life Insurance is thinking of creating a centralized "software assembly line."

▶Many companies are continuing to decentralize, while others never moved away from a centralized approach. See stories page 88.

QUOTABLE:

"MIS is starting to grow up."

Peter Balbus
Compass America

Centralized control makes comeback — with a twist

CONTINUED FROM PAGE 85

structure, according to Vice President Rick Omartian. That would mean a centralized data center and systems development, with maintenance pushed out to business units, he says.

This kind of structure would accomplish the overriding need for "better coordination" among the various businesses, Omartian explains. Toward that end, the dotted-line reporting relationship between divisional technology staffers and the corporate chief information officer is now being formalized, he says. Another big reason to centralize is the migration of the banking industry from Computer Associates International, Inc.'s CA-IDMS to a de facto DB2 standard, he adds.

Centralizing can have its benefits, according to Harvard University professors James Cash, F. Warren McFarlan and James McKenney. In the just-published new edition of their book, *Corporate Information Systems Management* (Business One Irwin, 1992, $39.95), the trio note the benefits of consolidated IS control: better ability to recruit and train staffers, easier development and enforcement of standards, better documentation and maintenance and better support of user-developed systems.

The bug has even bitten the military. In recent months, several branches have announced plans to cut costs by merging a variety of IS functions. The U.S. Air Force, for instance, plans to cut several dozen data processing centers to five or six. The U.S. Coast Guard is moving to standardize and centralize, and the U.S. Navy in also undertaking a similar study.

Tough realities drive change

Debates over how computing resources should be deployed are not new; paradigm shifts have occurred roughly every six to eight years. Today, it is widely agreed that no single IS structure suits every company and that the best choice depends more on the company than on any theoretical model.

"There is no *right* answer," says Peter Balbus, director of strategic planning at Compass America, Inc., a Herndon, Va.-based consultancy that evaluates data center performance. "More companies are striving for the proper organizational balance for their own needs."

Unlike some of the recent "What's the right shape for IS?" debates, the New Centralization is grounded in tough-minded, pragmatic business realities. Experts say these facts of life are fueling the new interest in centralization.

Among the main reasons, analysts say, are the following:

- **The growth of networks.** The booming popularity of electronic mail, electronic data interchange (EDI), electronic funds transfer and local-area networks has increased the need for tighter, high-level control and security, experts say.

These networking systems are often purchased by business units or departments with no central planning or control. As a result, many companies face compatibility problems, wasted resources and a greater need for what Gartner Group, Inc. calls "inter-enterprise planning."

At a lower level, the wildfire spread of LANs and, increasingly, client/server architecture has ironically also encouraged a new desire for centralized control. More IS managers now want to manage distributed networks from information centers.

GE Telecom created a centralized approach to installed LANs used in diversified businesses. The target date for executing the new centralized strategy is June; implementation of a standardized architecture will take place soon after. The company also established a coordinated buying approach [CW, Jan. 13].

- **Budget pressures.** As companies push through the recession, pressure continues to maximize corporate technology spending. Consultants say top executives are even less tolerant than ever of money-wasting duplication of efforts.

At J. P. Morgan, banking, human resources and trading systems are being recentralized. "There are substantial cost-savings in pulling back these products," including fewer software licenses and just one maintenance payment, explains Dominick Landi, managing director of technical center services.

Besides pulling back mature systems into a central IS unit, J. P. Morgan is also outsourcing commodity businesses, such as PC and LAN support. "Emerging technology niche products will still be developed in the branches, with help from our corporate technical center," Landi says.

- **Re-engineering.** Various polls indicate that many major U.S. firms are now planning or executing some kind of business process re-engineering. This radical redesign tends to expose any weaknesses in underlying structures, according to Gary K. Gulden, an executive vice president at CSC Index, Inc., a consultancy in Cambridge, Mass.

"In our experience, nothing puts greater pressure on — or reveals weaknesses in — the IS infrastructure more dramatically than a major cross-organizational re-engineering initiative," Gulden wrote in a recent CSC report. Infrastructure has a big impact on a corporatewide

Name your poison

Experts say dominance by either IS or users creates its own unique problems.

Too much IS power:

- 80% spending on maintenance, 20% on development.
- Focus on technical frontiers, not user markets.
- New systems must fit existing structure.
- Overemphasis on database hygiene.
- No new suppliers or services.
- Unhappy users.

Too much user power:

- No evidence of hard benefits.
- Explosive growth of new systems and support staff.
- Overemphasis on problem focus.
- Networks built for own needs, not corporation's.
- Little technology transfer.

Adapted with permission from *Corporate Information Systems*, Third Edition, Business One Irwin, 1992.

The shape they're in

You know the stereotypes: Central IS is unresponsive, expensive, backlogged, bureaucratic and arrogant. User-based IS is overconfident, antistandards, naive and arrogant.

How do you build around these? Judging from recent surveys, you combine the best of both worlds.

The latest studies confirm that most large organizations are moving toward a hybrid structure for their IS departments. This approach combines centralized and decentralized activities to put computing power where it's needed.

A new Booz Allen & Hamilton poll found that 40% of 360 Fortune 1,000 companies polled employ a mix of centralized and decentralized IS structures. However, nearly three-quarters said they expect to be fully decentralized in five years.

Similarly, a study from The Yankee Group showed that 40% of 100 companies polled had downsized their central IS organizations, shifted more responsibility out to the field or both.

Centralization helps mini IS department roar

BY DANIEL J. LYONS

Jim Ramsey says he believes a good centralized information systems department can do a lot with a little — even when the whole department consists of only four people: a part-time payroll clerk, an ex-quality assurance technician, a Unix/cabling expert and a minister in training.

Although the work force at ATR Wire & Cable Co. has swelled from 450 to 700 employees during the past two years, and manufacturing capacity and sales have increased by 33%, the company's IS department has not grown.

In fact, Ramsey, ATR's director of information services, says the Danville, Ky.-based company was actually able to trim its number of staffers from five to four because while data is centrally maintained, much work is pushed down to end users.

ATR manufactures steel wire used to make radial tires. A subsidiary of Tokyo Rope Manufacturing, Inc., ATR follows the Japanese approach of team decision-making.

Within the IS department, decisions are made by the staff. With Ramsey on a leave of absence studying to become a Methodist minister, David Caldwell took charge, after transferring into IS from the company's quality assurance department this past winter. Caldwell has no programming background.

Tom Rogowski

ATR's four-person *IS group serves 700 workers*

Galvanized into action

This motley (but highly effective) centralized team was launched into action a few years ago when company officials got fed up with data fragmentation.

"We have about 100 PCs, mostly stand-alone with connections to our 6000. In the old days, people were keying in data for themselves and saving it on Lotus 1-2-3," Ramsey recalls. "There was no centrality of data."

And that's a problem in the wire manufacturing process, he explains, where each step generates information such as the percentage of copper in the plating, the tensile strength and furnace temperatures. Previously, processing was handled solely on a Unisys Corp. System 80 mainframe running Cobol.

Compiling such data by hand was a nightmare, says Gary Kirkland, a process engineer. "When you have to sit down and punch in 200 or 300 three-digit numbers at the end of every day, the errors are unbelievable," he says.

So the IS team decided to spearhead the revamping of its company's information technology using a new Unisys U 6000/65 Unix-based, multiprocessing architecture and IS human resources, he says.

A good example is Unum. The Portland, Maine-based insurer is rethinking how it develops software, says John Alexander, senior vice president and CIO.

Unum is looking at creating an assembly line process in which software would be developed at a central location using object-oriented technologies, then shared across multiple operations.

"In that respect, we are starting to resemble the automobile assembly process," Alexander says. "Build [basic] modules at one plant and assemble them closer to the customer."

Ultimately, central software development should allow developers "to build certain chunks of code more cheaply," he says.

- **Shortcomings of decentralization.** While many companies remain committed to distributing computing and networking power, drawbacks are becoming more apparent.

PG&E's Wong: *"Businesses are now coming back and saying, 'It's costing too much. . . . Please take the lead. . . .' "*

"Decentralization was a misguided response to a legitimate need to better align [technology] with business goals," declares N. Dean Meyer, president of NDMA, Inc., a Ridgefield, Conn., consultancy. Meyer contends that shifting computing to business units has in many cases led to duplicated efforts and raised headcounts by as much as 50%. Moreover, he says, it has also lowered software quality, slowed innovation, hurt architectural integrity and raised overall corporate technology costs.

Even highly successful organizations are feeling some bumps. Pacific Gas and Electric Co. (PG&E) has a centralized, 500-person IS group charged with policymaking, standard setting and data administration. The California utility also maintains a 400-person decentralized organization to develop applications.

In the late 1980s, PG&E experimented with a more laissez-faire approach to users, says Nancy Wong, manager of PG&E's computer operations department. The evolution, she says, has been fitful. "Businesses are now coming back and saying, 'It's costing too much. . . . We're not in the business of computers. Please take the lead in helping us to define the most appropriate hardware and systems.' "

Wong recalls a meeting last month with the utility's largest division, which was experiencing trouble building links among key job tracking and costing applications. "There were so many different generations of hardware and software, so many workstations and platforms and no standards. Operating applications wouldn't talk to each other on the network," she says. "They said, 'This is absolutely critical. Please help us.' "

Wong says she believes a balance has been restored: Applications remain decentralized, although a number of high-powered systems, including customer service and work management, reside on the mainframes.

Products reflect trend

The growing interest in centralized control is reflected in new products. For example, Ungerman-Bass, Inc. will soon begin shipping a client/server network manager that mirrors a customer's organization: distributed, centralized or hierarchical. The OS/2-based product, part of UB's NetDirector and priced from $8,000 to $19,500, is billed as the industry's first flexible manager.

Some analysts say they also see a growing bond between network operating systems and network concentrators. In addition, the emergence of so-called "superservers" is viewed by some as a sign of increased centralization. And interest in big picture products, such as IBM's NetView and SystemView, remains high.

Evolutionary step

All this begs the question, "Is the New Centralization an important change of direction or merely another passing fancy?" Neither, say analysts, who generally view the new consolidations as an evolutionary step.

Compass America's Balbus says he sees the New Centralizion as the end of the "fad of the month" syndrome that has plagued IS for decades. Now, he says, companies are well on their way to choosing what's right for them.

Steve Smith, Compass America's vice president of technology services, adds that recentralizing "reflects a broad shift in the role of the IS organization from traffic cop to information utility."

Raymond Lane, a senior vice president at Booz Allen & Hamilton, Inc., disagrees. He predicts that decentralization will continue to gain favor and says more functions will be embedded in business units. "The existence of the corporate IS function is in jeopardy," he says.

Smith and others counter that steep price drops in mainframes and the emergence of more complex application development environments, such as DB2, ensure that user organizations will continue to call on a central IS group for help.

In *Corporate Information Systems Management,* Cash, McFarlan and McKenney say that pressures for "long-term information hygiene" will continue to drive centralization. "Over the long run," they conclude, "most stand-alone units will become part of the network and need to both receive and share data with other users and systems." Thus, centralizing will in some cases be delicate but necessary, they say.

No ideal solutions

Regardless of the long-term answers, some sticky issues remain today. Pinpointing and measuring total IS expenditures remains difficult, Wong notes. "There's no perfect answer to what is a corporate service," she concludes, "and what is a business unit" function.

Consultant Meyer says many companies still need to realize that while it's OK for technologists to serve as in-unit business consultants and define applications requirements, it's smarter to shift the actual building to central IS.

Innovative solutions are already starting to appear. Some large EDI traders are now standardizing multiple, independent EDI systems by building centralized gateways with minis and mainframes.

In the end, all agree that the New Centralization is an unmistakable, if painful, sign of progress.

"Clearly," Balbus concludes, "MIS is starting to grow up." •

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minicomputer. The plan was to have end users take on more of the programming chores using a Unisys computer-aided software engineering (CASE)/fourth-generation language tool called Mapper.

To interest end users in doing more for themselves, Ramsey holds end-user training classes — four sessions with 10 users each. The aim is to show engineers and others how to get the data they need from the system. Ramsey even added an executive information system that gives top brass a rundown on each day's work at the end of the day.

"We can search for data — sizes, ranges, anything we need," Kirkland says. "You basically write down the keystrokes and create a small run, just like writing a macro."

Currently, about 140 of the company's 700 workers use computers: 60 are office workers, and 80 are in production and laboratory jobs.

Pushing out queries and simple development work while keeping a strong central IS core has had several payoffs, according to Ramsey. Because users are more familiar with how systems work, they are more likely to ask the right questions when problems arise, he says. Snags can often be corrected in one pass today.

Letting users handle ad hoc requests has also freed up precious IS time. "Users are out there getting information without ever darkening our door," Ramsey says.

As a result, the IS department has more time to devote to other work. For instance, the IS team recently built a production reporting system using the CASE tool in five months instead of the 18 months it would have taken in Cobol. Two other systems took a combined seven months instead of an estimated 30.

"In those three systems, there are 300 programs that have been written, and most of them I've written myself," Ramsey says. "That would have been impossible in the past."

Ironically, Ramsey adds, the biggest problem facing IS now is keeping up with growing demands on the hardware. Despite these successes, he says he doubts IS can get much smaller, and he doesn't see a day when IS won't be needed at all.

"Without an IS department, you have no glue. There's a real danger of fragmentation of data," he says. •

Lyons is an Ann Arbor, Mich.-based free-lance writer.

Yamaha plays end users for all they're worth

The new interest in centralization doesn't mean that the decentralization movement has died. Far from it.

Forward-looking companies eager to boost user responsiveness and trim operating costs continue to push computing out to the field.

At Yamaha Corp. of America in Buena Park, Calif., IS division manager Chris Scharff is working to build a new organization during the next two years. He says the emergence of the client/server environment will soon give managers in U.S. sales divisions the power to access and manipulate raw mainframe data any way they choose.

A subsidiary of the Japanese musical instrument and sporting goods firm, Yahama America has an IS infrastructure that includes a Unisys Corp. mainframe, CTOS workstations, Apple Computer, Inc. Macintoshes and dumb terminals. The basic system receives inventory, writes orders and checks records.

"Our goal is for [users] to take more initiative in controlling what they do with the data," Scharff says.

Under the new structure, most systems development would be pulled off the mainframe and into the divisions. Scharff's 33-person IS staff would mostly handle database and local-area network management while maintaining communications standards and security.

"We still need to ensure, for example, that the guy who puts in the order and the person who does the accounting have the same customer number," he says.

Texas combo

Randy Ebeling, director of data processing at the University of Texas at Austin, now has 50 people writing application code. Another 250 systems programmers are scattered throughout the university's departments. Ebeling's group is looking to port most of the 400 database files now resident on an IBM mainframe to a Unix platform.

The university continues to expand, and more network users need access to the corporate database.

"There is no way that a centralized organization would be able to provide timely hooks for everyone," Ebeling says. "Why should users have to come to a centralized function and wait two years?"

General or universitywide applications will continue to fall under the domain of the central IS group.

Ebeling says another key role of his organization is to "build a corporate database mentality" through its hiring and training practices.

MARK MEHLER

Coors brews custom plan for Va. plant

BY ALAN J. RYAN

It's not easy being the first offspring of a famous parent. But things could have been lots tougher when Coors Brewing Co. opened its Shenandoah Brewery five years ago this month.

From the start, it was clear that the Elkton, Va., plant — Coors' first brewing venture outside of Colorado — would need very different information systems than its Golden, Colo.-based parent. The 350-person Elkton staff was only a fraction of the 8,000 workers at Coors' headquarters. Plus, the two locations also had different management styles and differing work cultures.

Today, Coors officials are happy they did not try to force the Elkton brewery into adopting centralized IS from headquarters, according to Terry Zinsli, manager of finance administration at the Shenandoah Brewery. The geographically separate IS operations share a goal of improving the bottom line but don't share the same systems. Elkton uses a mix of Digital Equipment Corp. midrange VAXs and IBM personal computers.

If Elkton had used the Golden systems, Zinsli adds, "We would have had to operate like Golden. That didn't fit into our scheme. It's not that they are bad — there is just something better."

Empowering the Shenandoah facility to make its own systems decisions has saved Coors millions of dollars, according to Zinsli, who oversees IS.

Autonomous IS *makes Shenandoah Brewery Coors' most cost-efficient plant*

For example, a warehouse system developed at Shenandoah Brewery tells loaders what row to put beer in, what row to take it from and what truck to put it on. "Without it, in the first year alone, we would have had $600,000 in overtime," Zinsli says. "That's quantifiable."

The decision to build a separate IS group made sense for many reasons, Zinsli says. While both plants use the same general ledger and material systems, the Shenandoah Brewery has developed other systems specifically for a smaller operation.

By keeping its own IS group, the Shenandoah plant is able to react quickly to marketplace changes, he says.

Carefully built systems and an environment that encourages workers to be enterpreneurial have enabled the Elkton brewery — designed to handle 60,000 barrels a day — to pump out 85,000 barrels daily.

Also, according to Zinsli, internal Coors measures show that the Shenandoah plant can produce beer more efficiently than either the Golden or the Memphis plants. "That puts us in a good position to expand when expansion is possible."

Not all golden

The split operations have not been without problems, however, Zinsli says. Politics, for one thing, have caused basic problems. "You are going to get the typical territorial concerns; there will always be spears thrown back and forth," he says, adding that disagreements among IS groups can always be worked out.

They also have to work to avoid isolation, according to Zinsli. "One question we constantly ask ourselves is, 'Are we creating an island?' We try very hard not to. We try to keep an open line of communication to create teamwork and nonpersonal ownership. We develop things that we share; Golden develops things that they share," he says.

Still, decentralization makes sense for Coors. "It works . . . where you have common goals because you share goals and direction," Zinsli says.

"Could you do it cheaper by centralizing? Probably — if all you are looking at is the expense. But would you improve the bottom line as much? No. You'd give up more profitability," he adds. •

Ryan is a *Computerworld* associate editor, features.

How two firms divvy it up

SONOCO:
Mix is best bet

Sonoco Products Co. is restructuring its applications development organization after a dismal bout with decentralization in the late 1980s.

Bernie Campbell, vice president of information services at the Hartsville, S.C., distribution firm, says developments were a microcosm of the trends in U.S. industry.

Like many companies, Sonoco looked to shift accounting, human resources, IS and other activities to the field.

But in IS, Campbell says, problems arose when approximately 40 applications developers scattered throughout 10 internal customer sites got bogged down trying to meet all clients' computing needs.

Technical innovation also lagged, he says, as the specialists began to spend most of their time maintaining existing systems.

The solution? Create a new organizational model in which each business unit would have its own internal strategic consultant.

Now, the central IS organization competes for its share of the company's total available IS dollars.

"What matters in the organization is not whether application developers or strategic consultants report physically to a central IS organization or to our five manufacturing divisions," Campbell concludes. "What does matter is that these roles are clearly defined."

……

COOPER ENERGY:
Central holdouts standing firm

The growing interest in centralizing is nothing new to IS.

"We look at [decentralizing] every two years or so, and we're still convinced it's nothing but a fad," says James Dean, director of MIS at Cooper Energy Services Group, a Mount Vernon, Ohio, manufacturer of equipment for the oil and gas industries. "It would mean lots of inefficiencies, no synergy of support and goals, everybody developing their own islands" of technology, he adds.

Dean also says he believes that shifting responsibility to the divisions would entail a staffing nightmare and a nearly fourfold increase in IS spending, which now runs about 0.7% of sales.

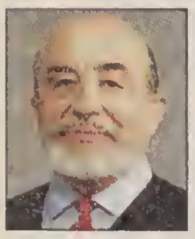
Cooper Energy, to date, has decentralized only one small IS area — computer-aided design and manufacturing applications.

"In the end, how you organize IS is a function of how you run the rest of your company," Dean concludes. "The organizational structure of the company dictates our approach."

A CHARTER FOR IS

Charles P. Lecht

Now more than ever, a plan



I wrote the following charter at a friend's behest 20 years ago. It may be even more relevant today than when it was written.

The primary mission of the information systems department is to create the proper procedural environment for the orderly regeneration of the corporation's operational environment as it pertains to: 1) the acquisition, purification, storage, processing, retrieval, presentation and dissemination of information for management at all levels and 2) the creation of organic harmony in the integration of man/machine information technology systems into the day-to-day affairs of the corporation.

The IS department's primary mission is supportive of, subservient to and embedded in the overall corporate plans, procedures and objectives as established by the corporate planning committee.

Its role in the corporate environment is unique in that it cannot create a product to be delivered to the corporation without the dynamic and day-to-day participation of the various corporate organizations that the product is to serve.

Its measure of success is in its ability to proliferate its capabilities throughout the corporation and to ultimately lose its identity as a corporate organization.

In concert with the broad objectives outlined above are those involving the IS department's role in providing guidance in the allocation of funds to be invested in data processing resources. In doing this, the IS department is required to achieve a proper, timely and in-context capability to ascertain the technical, political, psychological and financial impact of the use of information technology in support of the corporation.

The IS department will prepare and maintain a plan to include long-range objectives, each defined as the outgrowth of a set of short-range accomplishments. The IS department must prepare and maintain its own operational procedures and standards to serve as an in-flight guidance system to ease the corporation's transition from systems of the past to those of the future in an atmosphere of realism dedicated to fulfilling the urgent needs of the present.

Never before has the job of managing an IS department been so difficult.

The information technology manager of yesteryear had few corporate critics in comparison to the number he has today now that computers have become ubiquitous. At least in the early days, everyone confessed his computer illiteracy quite readily. But today's IS department manager has a chorus of "experts" dispersed throughout the corporation, all of whom have had at least an introduction to a small computing system.

Maybe we are just now acting out the final scene in an unfolding IS department drama. One at whose end occurs the death of IS departments everywhere.

I can see it now: The technology, having proliferated, now creates a school of self-proclaimed computer literati who, like piranhas, arrive at headquarters to eat the last IS department manager. Finally, IS department success? •

Lecht is an IDG News Service correspondent based in Tokyo.

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Get Rich, quick!

When there's a vendor to lampoon or an issue to zing, Computerworld *cartoonist Rich Tennant is ready with his wacky humor and razor-sharp pen*

BY PAUL GILLIN

When I came to Computerworld *five years ago, my boss one day was tying up a few loose ends on what my responsibilities would be as executive editor. "Oh, by the way," he said, "you'll also be the main contact for the editorial cartoonist."*

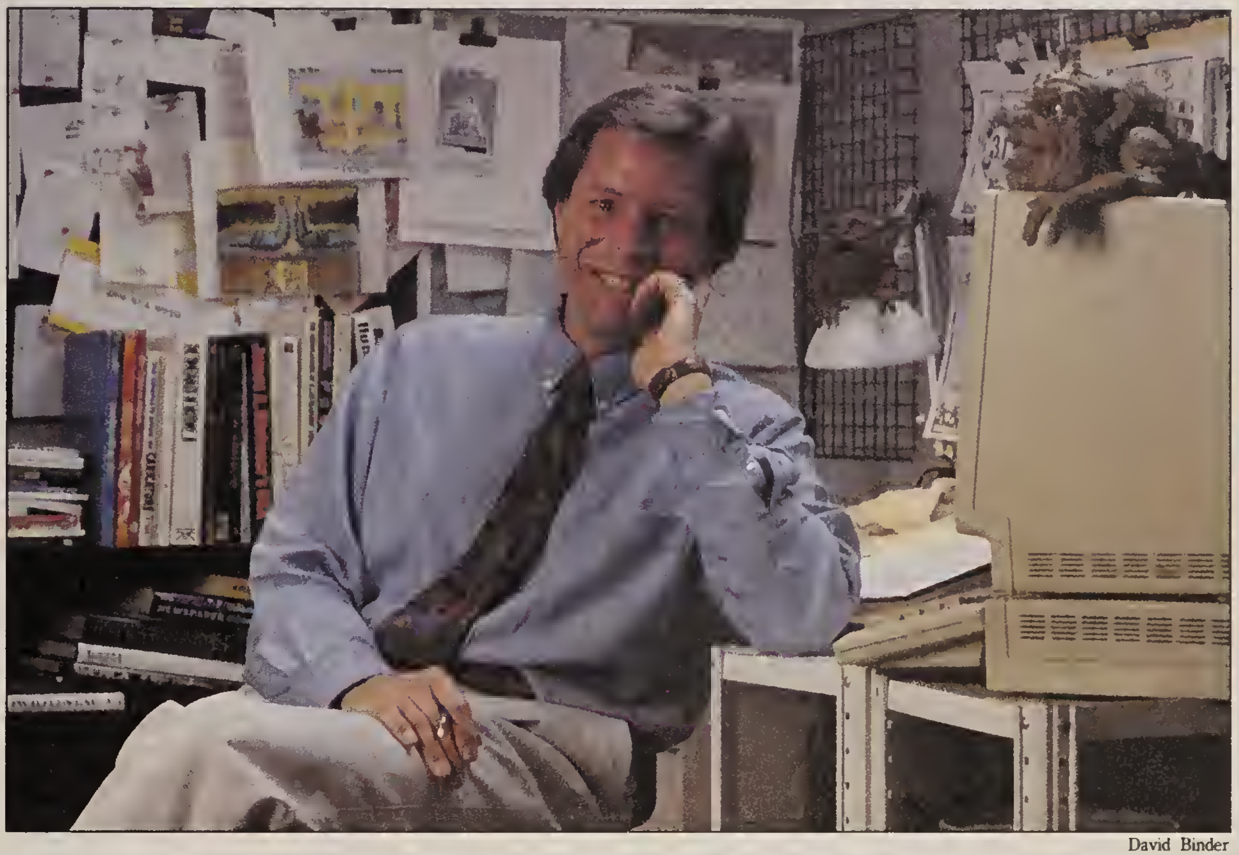
Thus I became a charter member of the Rich Tennant fan club.

Tennant has been drawing cartoons about computers and the people who use them for eight years. His slightly warped figures with their big noses and what he calls "croquet-ball eyes" have skewered the industry's high and mighty on Computerworld*'s editorial pages since 1986. For the past 18 months, his* 5th Wave *comic strip has appeared on page 2 documenting the silliness that occurs when otherwise normal people spend several hours a day staring at a screen. When* Computerworld *didn't run* The 5th Wave *one week to make space for an announcement, we received more letters and phone calls than on any topic we've covered during the last year.*

Tennant is also the editorial cartoonist for International Data Group's Federal Computer Week, *and his work has appeared in some of the country's largest newspapers. He is the only cartoonist I know of who has been reprinted in* The Wall Street Journal. *Last month, his first book of* 5th Wave *cartoons appeared on bookstore shelves, published by Andrews and McMeel, the same publisher that handles* The Far Side*'s Gary Larson and* Doonesbury*'s Garry Trudeau.*

Cartooning was not Tennant's first job, or even his sixth or seventh. He's had a pinball game of a career, including jobs as a caterer, advertising account rep, housepainter, musician, actor, sandwich board salesman and even a Computerworld *typesetter. He is an accomplished pianist and arranger and such a good cook he could probably make chef's assistant at a swanky restaurant.*

Tennant's modesty, wit and low-key style make him an easy guy to like. In a recent conversation at his Rockport, Mass., studio, he talked about the joy — and the pain — of having the sharpest pen in the computer industry.


David Binder

Tennant: *'The editorial cartoon feeds me and destroys me at the same time'*

Q You say your big career break came when you were fired from *Computerworld.* What do you mean?

A I was a typesetter at *Computerworld* beginning in 1982. I had been out of a job for a while and needed the work. But I was miserable. I always felt that there was something else I was supposed to do.

I had always been a creative person growing up. I played the piano, I acted in community theater, I drew. Looking back, getting fired was the best thing that could have happened. It forced me to look to myself for how I was going to make a living.

Q How did you choose computers, of all things, as your subject?

A Luck of the draw. It really saved my life. When I worked at *Computerworld*, somebody said they needed a cartoon to fill a spot, and it had to have something to do with computers. It was supply and demand. If I had been fired from *Scrap Iron Weekly*, I'd probably be doing a lot of smelting cartoons and still painting houses on the weekend. But I happened to pick a global industry that's changing the way people live and work. I was immensely fortunate.

My first regular job was at the *San Jose Mercury News*. The editor of the weekly computer section called and asked me to start running [my work] there. But I didn't have a name for the cartoon at the time. I didn't want to do something corny: Computer Comics or High-Tech Hijinks or anything stupid. Then I

Continued on page 92

Continued from page 91

remembered a book by Alvin Toffler where he talked about the information revolution being the fourth wave. So I called the editor back and said, "Let's call it *The 5th Wave*."

But the next day, I realized that Toffler's book was talking about the information wave as the third wave, not the fourth. I was off one wave. So I called the editor and said, "We've got to change it to *The 4th Wave*," but it was too late.

Q Is there a formula for an effective cartoon?

A There are certain formulaic elements. When I don't feel funny, I have to fall back on those formulaic things. For instance, I can construct a sentence that's very serious for the first three quarters of it and then throw in something silly at the end, like "a 16-MHz, floating-point coprocessor-to-LAN-to-Mr.-Frosty link."

My cartoon is never drawn at the point of the joke itself. It's generally after the joke has happened. The joke is not that somebody fell on a banana peel, but what happened after he fell, or why he fell.

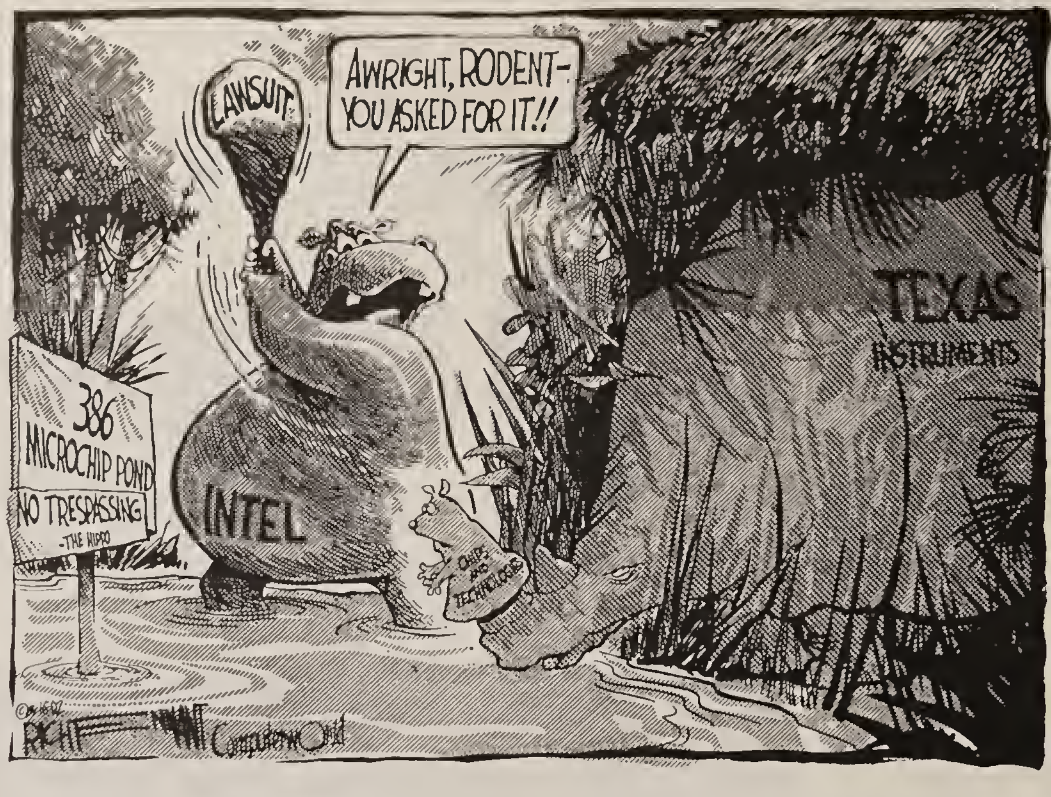
Q How is an editorial cartoon different from your panel cartoons, like *The 5th Wave*?

A The editorial cartoons are the most achingly wrenching cartoons to do. Every week, I go through a labor and a birth. It is the most rewarding form of cartoon I do. And it's the one that hurts the most if I don't do it well.

Q Why is the editorial cartoon so rewarding?

A Because it's so difficult. You're juggling so many elements. I think the first function of an editorial cartoon is to get the idea across. The second is to be funny. And sometimes you have to educate, too. I often have to set it up, help people form an opinion and then get the point across on top of that. It's like juggling a cherry and a chain saw and a light bulb.

The editorial cartoon feeds me and destroys me at the same time. Sometimes I'm up in that studio, and I turn into Fredric March. I'll brood and pace the room, and I can't do anything until it's done. My wife will try to calm me down, and I'll be crabby and mean. And then, all of a sudden, the idea comes, and I'm sweet as can be.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TEXAS INSTRUMENTS
RICH TENNANT ComputerWorld

There's this businessman inside me who comes out occasionally and puts forth the idea of quitting doing the editorial cartoon. I've quit a number of times in my mind because it's too stressful. But then I realize that while that stress element would be gone from my life, what would also be gone would be the challenge of when it's done right. I'm proud to be an editorial cartoonist, a member of the fraternity of visual journalists.

Q What makes for a good editorial cartoon?

A A good story for me is one that has real drama. Take the one about Intel threatening to sue this little company called Chips and Technologies. Suddenly, Texas Instruments is making rumblings about coming to the little guy's rescue (see cartoon above). I liked that cartoon visually, and I liked the metaphor and the abstractions.

I'll sit down with an article and read it over and over. Sometimes there's a word or a part of the story or a phrase — like a "foundering flagship" — that's key. It will conjure up an image. Or I'll try to draw on some other news event that's going on, like the Academy Awards. I try to cast my cartoons too. I'll draw a face several times before deciding on something.

Q My favorite cartoon of yours ever was the one with DEC's Ken Olsen's mouth being drawn up in a smile by his PR guy (see cartoon page 91). What did you think of it?

A I liked that one, but it's not one of my favorites. There's not a lot of elegant drawing in it. I look at the cartoons as drawings, maybe to a fault. I get very hung up on the way they look.

I'm like that in everything I do — very visual. When I draw, I like big, bold strokes. When I cook, I like vibrant, strong flavors that come through; I even like a strong visual presentation. I like big reds and yellows.

I created a salad once I called Cat Scratch Salad. It had dark greens, and then I took red peppers and cut them finer than matchsticks and threw them on the salad so they made this cat scratch look. Food entertains you on a lot of levels. It's visual; it's writing.

I have a goal to draw faster and looser and not to be so exact. When you go fast, there's something in the process that isn't planned, and that's exciting. It's like playing jazz. It's improvising.

As a kid, I was a very exact artist. Now I have to unlearn that. I want to become more abstract. If you look at [*The Chicago Tribune*'s] Jeff MacNelly, he almost sketches with his pen, but he is so riddled with technique there are no wrong lines.

Q Who are your professional heroes?

A MacNelly, Don Wright of *The Palm Beach Post* and Mike Luckovich of *The Atlanta Constitution* for editorial cartoons. For single panel cartoons, Gary Larson, Tom Cheney and Gahan Wilson.

A good cartoonist gives you a feeling about things that goes beyond the pictures of the things themselves. MacNelly draws a '56 Dodge pickup truck better than the real thing. It's slightly bent.

I've always admired the pianist Bill Evans. He was perfect because his music went beyond the notes that he played.

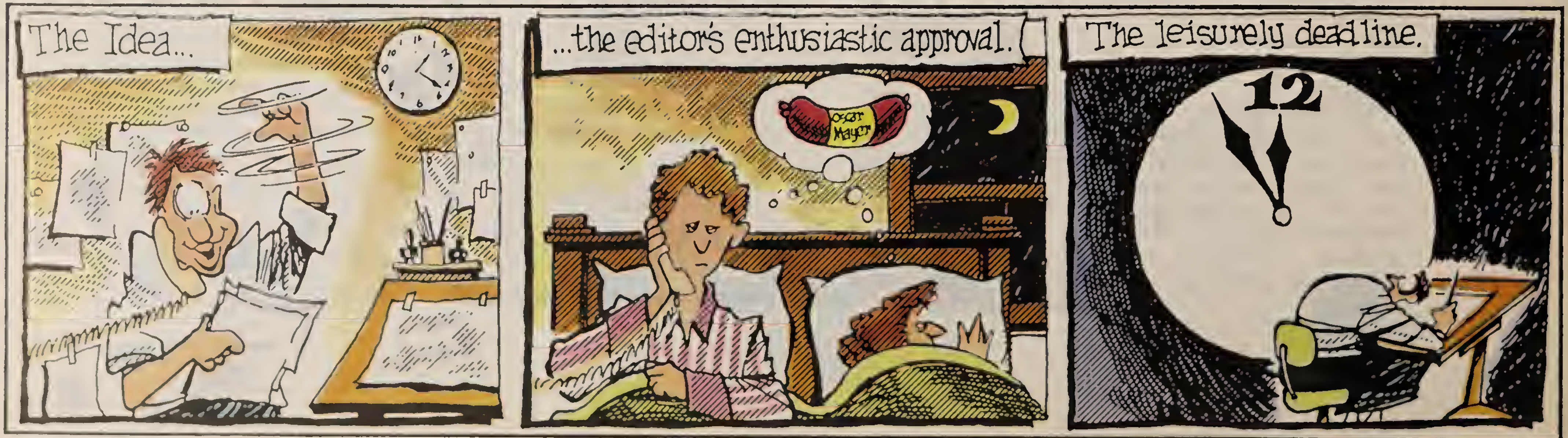
Q You have done a book before, haven't you?

A I had a book called *I Hate Computers* that I did several years ago. It was basically a one-joke book that showed people disposing of computers in creative ways. It's a little scary to look at that book now and believe it's me. It's like looking at an old photograph of myself. I feel like I could never do that kind of thing again.

I was always a funny guy at dinner parties. People said because I could draw I should be a cartoonist. It wasn't that easy. When I try to be funny on paper, I can't rely on any of the gestures I can use in person. It was a long learning experience. •

ANATOMY OF AN EDITORIAL CARTOON

Listening to the editor's ideas.
Oscar Mayer
COMPUTERWORLD
Cartoonist's creative process.


The Idea...
...the editor's enthusiastic approval.
Oscar Mayer
The leisurely deadline.
12

EXECUTIVE TRACK

William Congleton has been named director of information systems and operations at **J. D. Power and Associates**, a marketing information company in Agoura Hills, Calif.

Previously, Congleton was a consultant/manager at United Research Co. in Morristown, N.J., which is now a subsidiary of Cap Gemini Sogeti USA. At United Research, he provided management consulting for North American and European clients in information processing, communications technologies and business integration. He holds an MBA from Harvard University and a master's degree from Northeastern University.

David A. O'Connor has been named chairman of the board of directors of the **Electronic Funds Transfer Association** (EFTA) in Herndon, Va. He is president and chief executive officer of Internet, operator of the MOST automated teller machine and point-of-sale network.

Before taking the helm at Internet, O'Connor was president of CashFlow, an electronic banking subsidiary of Sovran Financial Corp. (now NationsBank). He was also president of the Mid-Atlantic Exchange, senior vice president of Virginia National Bank and senior vice president of Sovran Bank.

Gary Roboff was named vice chairman of the **EFTA**. He is vice president and director of business planning and strategy development in the electronic banking group at Chemical Bank.

At Chemical, Roboff's responsibilities include developing strategy for the bank's self-service delivery channels, debit card programs and home banking functions, new technology development and assessment of new business partnerships.

Before the recent merger of Chemical and Manufacturers Hanover Trust Co., Roboff was director of retail distribution services at Manufacturers Hanover's regional bank.

Preparing for the future, today

Pacific Bell's Firdman keeps year 2000 in mind while redesigning IS infrastructure

PROFILE: Eric Firdman

Stella Johnson

Position: *Director of strategic information systems at Pacific Bell*

Mission: *To design the firm's future IS infrastucture, which integrates legacy systems*

BY JEAN S. BOZMAN
CW STAFF

At age 55, Eric Firdman has had enough computer careers for two lifetimes. He spent many years as a computer designer in the Soviet Union before Gorbachev's *perestroika*, and he has had two more positions since his 1981 arrival in the U.S. — first as a researcher at Hewlett-Packard Co. and then as an independent consultant in artificial intelligence.

Now, as director of strategic information systems at Pacific Bell, Firdman is far away from the days when he designed Soviet very-large-scale integration (VLSI) circuits and taught relational database theory at Vladivostok State University.

One year after arriving at San Ramon, Calif.-based Pac Bell, Firdman is envisioning the California telephone company's business in the year 2000 and working to design the hardware and software information systems systems to support it.

Firdman's year-old Strategic Information Systems Group, which employs 50, focuses on re-engineering the systems that support the business process and on the application of knowledge-based systems in automation.

All of the new systems should fit under a technology umbrella called Netsys — the eventual marriage of Pac Bell's telephone network and computer technology after the year 2000.

Financial boost

These next-generation systems should support the creation of new revenue sources and reduce overhead costs, Firdman said. One reason for this dual imperative is that the regulated side of Pac Bell's telephone business is being squeezed by competitors such as MCI Communications Corp. and U.S. Sprint Communications Co.

These competitors will soon enter the market for calls made in California — a market Pac Bell dominates. Previously, these firms offered only long-distance service to Californians.

Finding new revenue sources is a tall order for anyone, even for Firdman, who relishes change. An energetic, animated and talkative leader, Firdman says he must first build trust inside Pac Bell's IS organization of more than 1,500 people.

In engineering new business processes, the Strategic Information Systems Group may run into resistance in Pac Bell's management ranks.

But the process of redesigning Pac Bell's IS infrastructure — systems that support everything from taking customer orders to installing telephone lines — will not happen overnight.

Continued on page 94

Firdman's rules of management

To create new kinds of information systems, Pacific Bell's Eric Firdman is attempting to break the mold of industry-standard IS management. He is challenging his project managers to see things in new ways and to try them out in their designs for the re-engineered IS infrastructure. That is why he is willing to put some "new-wave" management theory into practice.

His "rules" are as follows:

- **Empowerment.** "The art is not to overcontrol these project managers," Firdman says. "When it comes time to report to our executive vice president, I want them to come in and present the project to him.

"When I first said to many of the people on my staff, 'I want you to be empowered,' they didn't believe me. They wanted me to prove it. It's not the people who should have to prove to their managers that they can do good work. It is the managers who should prove that they can manage the people and empower them."

- **Respect.** "You should respect your people because it really makes them feel good. You should select your people by their capabilities, then let them go to work. As a manager, you need to be consistent all the time. But there's a subtle boundary between democracy and dictatorship."
- **Small working groups.** "I don't think we need too many people. It's much better to have two very good people than to have a larger group of 10 or so. The communications overhead in a small group is less, and they come to feel that the project is really 'their' project."
- **Granting responsibility.** "I'm trying to put together a matrix organization. The point is to give more power to project managers. Usually, they have the responsibility to get the work done on time, but they don't have power and they don't have resources. Now, they will have [the] budget, responsibilities and people to get the job done," Firdman says.

JEAN S. BOZMAN

Preparing for the future

CONTINUED FROM PAGE 93

There are more than 300 older legacy systems that run the $8.85 billion business.

"It's unrealistic to replace all of our existing systems since they were a multibillion-dollar investment," Firdman says. "Our major problem is maintaining consistency between the data sources in our legacy systems and the new systems."

Born in Leningrad (now called St. Petersburg), Firdman was the founding director of an AI laboratory at the USSR Academy of Sciences. He worked on the computer-aided design of VLSI chips for Soviet microcomputers during the 1970s. In 1974, Firdman went to Vladivostok State University, in the extreme eastern reaches of the USSR, in 1974 to teach relational database theory and AI techniques.

In 1978, he requested permission to emigrate from the Soviet Union but was denied a visa. He was able to immigrate to the U.S. in 1981, however, and he moved almost immediately to Palo Alto, Calif., where he became a researcher for HP. He later founded a consulting firm, Henry Firdman & Associates, Inc., which counted IBM, McDonnell Douglas Corp. and Pac Bell among its clients.

In addition, he is the author of *Strategic Information Systems: Forging the Business and Technology Alliance*, which was published last year by McGraw-Hill, Inc.

Re-engineering expert

Firdman's expertise lies in process engineering and in applying expert systems technology in re-engineering, says Jack Hancock, executive vice president of the Product and Technology Support Division at Pac Bell, to whom Firdman reports.

Tying together disparate systems through a common user interface is a key goal of the re-engineering effort. "One of the ways you bring the network and the systems together is by close integration at the front end," Hancock explains, "and that's exactly what Firdman's group is doing for us."

Many of the new systems fall within a client/server architecture in which intelligent workstations gather data from many databases. The 50 staffers in Firdman's group are a mix of technical experts hired from the outside and Pac Bell employees who transferred into the group. More than 10% of the staff hold doctoral degrees.

Exemplifying the design challenge facing Firdman's group is an existing computer system called Engineering Data Acquisition System (EDAS), which collects data on billing, networking and customers from the telephone switch. As Pac Bell's architecture changes, EDAS has to share data with new systems in a consistent way.

When something goes wrong, the system must reroute the incoming calls to another switch.

"We shouldn't design systems in a piecemeal fashion," Firdman says, sketching out several interrelated systems on a white board. Business managers throughout the 54,000-person Pac Bell organization must understand and approve of the process changes.

> "OUR MAJOR PROBLEM is maintaining consistency between the data sources in our legacy systems and the new systems."
>
> ERIC FIRDMAN
> PACIFIC BELL

"So much of the network is touched by any new system," Hancock explains, "that the others in the company have to buy into it." That includes customer representatives, telephone installers, technicians and managers across California.

Going the distance

Accordingly, Pac Bell has dozens of "user councils" that comment on new systems as they are being designed. Some people travel hundreds of miles to spend a few days with Firdman's group — and often the strategic IS staffers travel out to the business units.

"There's probably nothing worse than having a central systems group deciding how a process ought to operate," Hancock says. "But, on the other hand, if you just had the users doing it, they would typically opt for doing it the same way as before, only with faster technology."

Getting other business managers to "buy in" to the re-engineering concept has been difficult, Firdman acknowledges. "I had to have some time to learn the business," he says. "Sometimes, people were nodding 'yes' in a meeting, but nothing happened. They just didn't get the whole picture, or they didn't feel the urgency."

Firdman has decided to be patient and not throw technology at business managers. He just keeps talking, trying to enlist their support in the re-engineering effort. "Some days they say I'm a visionary," he says, with a Russian shrug, "and some days they say something else."

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Electro '92. Boston, May 12-14 — Contact: Natalie Perlin, Electro '92, Los Angeles, Calif. (310) 215-2976.

Re-engineering: The Implementation Perspective. Chicago, May 12-14 — Contact: Hammer & Co., Cambridge, Mass. (617) 354-5555.

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COMMENTARY

Les Gilliam

Can users manage IS?

While many people are hailing the demise of the central IS management group, let us pose one sobering thought before we celebrate the end of centralized IS tyranny.

Does the management of the user group, which wants its own dedicated computing resource, really understand what lies ahead?

The cost of computing power has fallen dramatically in recent years, making the mainframe appear overly expensive and enticing users to acquire their own networks and processors. But the IS function entails far more than just buying the hardware and software. Are the users prepared to take on all the responsibilities that have become a natural part of the central IS group?

In the not too distant future, the trend to decentralize computing may very well reverse. Business unit managers may wake up and realize the extent to which computing is interfering with the operation of their primary business. In many cases, there will be the desire to return some of the functions to the central IS group, which is better prepared to handle such functions.

In particular, end-user departments may find a tough row to hoe in the areas of personnel management, resource management, applications management and technology management.

- **Personnel management.** User management may find that it is not easy to offer a career path to computing professionals out in the business unit.

Can the user group offer opportunities for advancement? Or will the computing people be considered only staff to the business unit professionals? How well will user management be able to assess the quality of performance of the IS staff?

Quite often, user management does not realize the extensive training required to keep the IS professional current. Will the compensation levels of the computing people be perceived to be on a par with the business unit professionals?

- **Resource management.** Users are usually not prepared to implement good problem management and change management practices. Capacity planning and performance monitoring may only use the "gut-feel" method. And most auditors will tell you that the lack of good security practices is a common problem with user groups who have their own computing resource.
- **Applications management.** Perhaps the most difficult aspect of computing since its inception has been the development of applications. Historically, development projects have been fraught with cost and time overruns. Many central IS groups neither use a methodology nor abide by consistent standards.

> QUITE OFTEN, USER management does not realize the extensive training required to keep the IS professional current.

So we should not be surprised that users who take on this function will be no better and probably inferior to the central IS group in developing applications. If users do not want to pay centralized IS to maintain a trained and qualified support and maintenance staff, should we also be surprised if the users are negligent in this area?

- **Technology management.** The rapid rate of change continuing to occur in the computing field may come as a surprise to the neophyte IS manager. Vendors continue to offer newer, faster and cheaper products that contribute to this technology shock.

The manager of a computing resource, even one located in the business unit, cannot ignore the opportunities available to those who possess the experience, knowledge and skill to acquire and implement the best solutions that the new technology offers.

We have seen a tremendous improvement in the availability of user-friendly computing tools, and no doubt it will continue. But this does not lessen the need for a central staff of experienced and qualified computing professionals to provide the IS leadership, set standards and ensure compatibility across the corporate network.

A solution being pursued by many organizations today is to place certain IS professionals out in the business unit, but those experts remain a permanent part of the central IS organization. The central group provides the services discussed above through a combination of central and remote staffs and charges the user group a reasonable fee for these services. With this arrangement, the user still maintains control of the services but lets the IS management and professionals do what they do best.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

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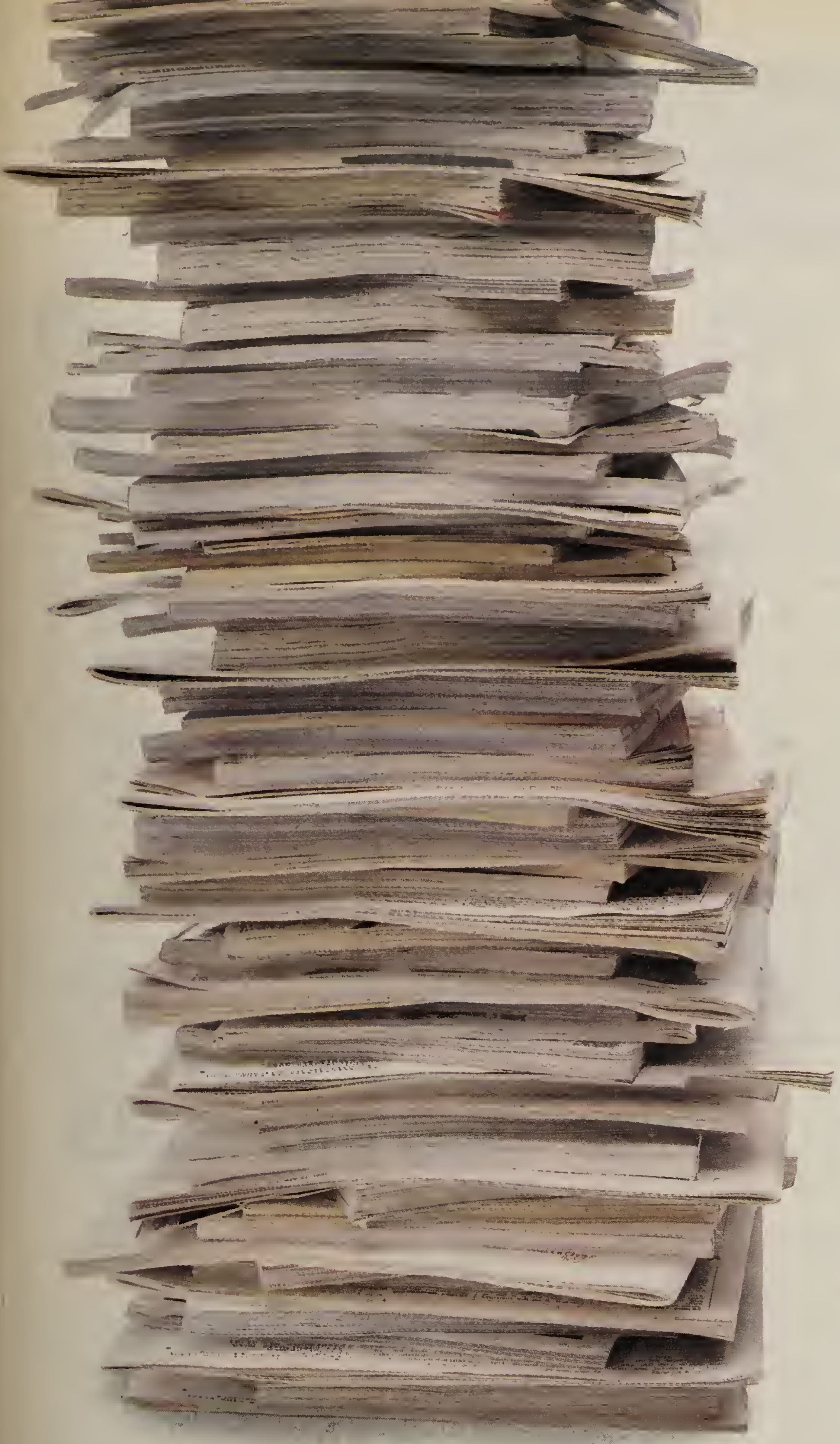

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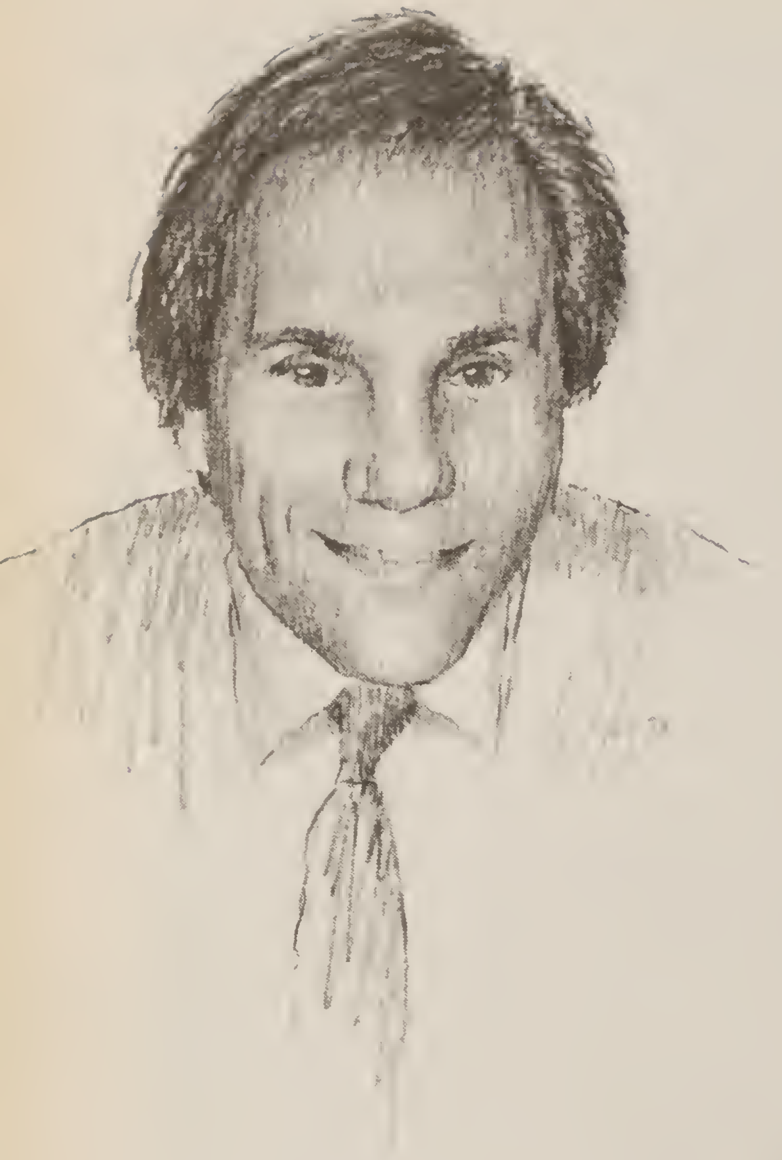

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Picture yourself as a CIO? Be sure your image is current

BY ALAN RADDING
SPECIAL TO CW

If your dreams for advancement include eventually rising to chief information officer, be forewarned — the position is undergoing a radical transformation and so should your strategy for reaching the top.

"The way to move up to CIO is to move laterally, take another assignment or two outside of IS," advises George DiNardo, former CIO at Mellon Bank in Pittsburgh and now a consultant and adjunct professor at Carnegie Mellon University. "My chief of programming at Mellon now heads a banking group."

For CIO hopefuls, executives and consultants agree that participating in corporate strategic planning is an excellent way to get on the inside track. But prospective CIOs, take note — the goal you're pursuing is changing and will prbably change more before you get there.

Caught between conflicting corporate impulses — frustrated with information systems yet urgently needing its product — CIOs are finding themselves on the hot seat.

"CIOs are being knocked off in alarming numbers," says Bernard Mathaisel, director of Ernst & Young's Center for Information Technology and Strategy in Boston.

A former CIO at Walt Disney Co., Mathaisel attributes the turnover to economic decline, business process re-engineering, the growth of enabled learning organizations and a move to new technologies.

Caught in the middle

The CIO often finds himself in a catch-22 situation, according to Craig Goldman, senior vice president/CIO at The Chase Manhattan Bank NA in New York. "A lot of people are questioning the effectiveness of [information technology]. On the other hand, there is a greater awareness of the importance of information and technology to the business," he explains.

Some see it as a no-win situation. "If the CIO asks the CEO for $50 million to prepare the infrastructure for client/server computing, he will get tossed out," Mathaisel says. "But, woe to the CIO when the users suddenly start demanding things such as client/server systems, and the infrastructure holds them back. He'll get nuked out of his job."

To survive these intense pressures, CIOs have begun to redefine themselves. Instead of a glasshouse king, today's technology chief is a team builder, change agent and in-house consultant.

Janell Genovese

Robert Tucker, CIO at Key Services Corp., the operations subsidiary of Key Corp., a bank holding company based in Albany, N.Y., has found himself in that situation. Five years ago, Tucker estimates, he spent 90% of his time working with programmers. "Now, I spend maybe 30% of my time on that kind of activity," he says.

Some also see the chief as a kind of corporate superlibrarian: One who is responsible for erecting and maintaining information structure, keeping shelves stocked and advising users on resource use.

But in many organizations, the most important new role for the CIO is that of in-house consultant. From now on, advising top management on systems and business matters will be "a far more critical" task for CIOs, DiNardo says.

On the operational side of the business, acting as a change agent is another key role for CIOs. As more IS departments are reorganized, restructured, distributed, downsized and outsourced, organizations are willing to pay top dollar for the right person to lead them through those drastic changes.

Lee Silver, president of L. A. Silver Associates, an executive recruitment firm in Framingham, Mass., says, "We're looking for some very high-paying CIO positions right now — $150,000 to $200,000 — where the person is going to spearhead changing the role of IS."

Details less important

The lucky CIO who lands one of these top positions, Silver says, will be "a big-picture, solution person, not a technical-detail kind of person," probably with a consulting background. Experience in a variety of companies plus business and finance savvy are key prerequisites. Silver adds that hands-on technical knowledge counts less than a solid grasp of IS trends.

William Grady, a partner at Romac/DP Boston, a division of recruitment firm Romac & Associates, agrees that the emphasis has shifted from technical acumen to managerial and business skills, especially in big companies.

"Large organizations have a layer of technical people who provide the technical expertise," he says. "The CIO is as likely to come from outside IS as inside and be wired into the business."

That's the case with Esther Delurgio, vice president of IS at Mitsubishi Motor Sales of America in Cypress, Calif. "More and more I rely on my direct reports to carry out the technical solutions," she says. "I'm doing a lot more motivating of people and looking toward the future and drumming up new projects."

Another good example of the new breed of CIO is John Alexander, CIO at Unum Life Insurance Company of America in Portland, Maine. After four years as a consultant at Arthur Young & Co. (now Ernst & Young), Alexander held several high-level corporate IS roles at various companies. Today, he sees himself primarily as a coach and team builder who "teaches business people how to use the tools."

Other steps to position yourself for the CIO slot: Cultivate good communication skills and team leadership ability — particularly the ability to motivate others — and develop a strong grounding in business. An MBA isn't necessary, although it is a sign of a candidate's business interest and skills.

Radding is a free-lance writer based in Newton, Mass.

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Requirements: a Bachelor's degree or equivalent combination of education and experience, several years of experience with X server internals, and a good background in raster graphics techniques, network protocols, and geometry. Must have a good understanding of large project software engineering principles.

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Don't be fooled by the counteroffer

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest advisers are Pam Summers, vice president and MIS specialist, and Jack Ferrara, senior data processing consultant. Both work as The Career Doctors at Russoli Associates, Inc. in Allentown, Pa.

Q: I have had an offer from a competitor that has the exact same hardware and software as my current firm. The position is almost the same as my current position, but it's a 7% raise, and my commute would be five miles less.

My boss said that he would give me a $10,000 raise if I stay. What should I do?

A: Never, ever, ever take a counteroffer. Any time you catch your company off guard, you are setting yourself up for the counterpunch. They may act as though all is forgiven, but they'll never forget. They have projected the $10,000 divided by 26 pay periods, but your company is likely planning on replacing you as soon as it can, so it is figuring on a payout of three to five pay cycles at most. A 7% raise in this economy, on the other hand, is a gift — grab it!

Q: I am a systems analyst with a degree in computer science and about nine years experience in the data processing field. I was previously employed in Saudi Arabia under a solo contract and terminated my contract to return to the U.S. in hopes of obtaining a contract that included my spouse.

However, since I returned, I have had a very difficult time obtaining employment back in Saudi Arabia. Please give me some advice.

A: Because you are looking to go back to Saudi Arabia, contact people you worked with before. It may be necessary to plan a trip there and let companies know you will be available to interview. You may also want to find a recruiter that specializes in overseas placements.

FAST TRACK

CAREER ADVICE FOR THE '90s

Q: I always get flustered when I'm asked certain questions during an interview. How can I handle the following types of questions: "What is your biggest failure to date?" "What did you think of your last company?" "Where do you see yourself in five years?"

A: I'd suggest the following responses: On failure: "I would say my biggest failure to date would be not getting this job if it happens that I'm not your next hire." On previous employment: "I can't say enough good things about my past boss and company, and when I leave my next firm, I would hope to be able to say the same." On the future: "In five years, I see myself being better technically, better professionally, more well-rounded and hopefully contributing to the growth of this firm. Where do you see someone at my level in three to five years?"

Remember, all good salesmen answer a tough question with a question — and make no mistake, you are selling yourself in an interview.

Q: I dislike my current position, but the economy still seems stagnant. When should I test the waters?

A: If you feel there's a possibility that your job may be cut, you could be testing the waters too late. Testing the waters is usually an ongoing process for the smart information systems professional. It might be a good idea to form a relationship with a recruiter who can look out for opportunities.

Tell the recruiter you are not on the market, but if something should arise that he feels you would be interested in, he should run it by you. However, you don't want to get involved with an organization that floods the marketplace with your resume.

☞ *We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522 or send them by fax to Kelly Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.*

TIP of the MONTH

How to conduct a rewarding job search

OK, so '92 may not be shaping up to be a great year in the job-finding department. But that doesn't mean you have to stick with a job you don't like or resign yourself to the unemployment rolls. Computerworld *surveyed a cross section of recruiters, placement experts and information systems managers and turned up a lot of ideas about how to connect with a good job — none of which depends on resume appeal:*

▶**Use vendors and consultants**. If you've got a rapport with a vendor or consulting company, exploit it. These people are in constant contact with user and vendor companies and therefore know who is looking and for what specific skills.

▶**Build knowledge in a hot skill area**. Find out from research and networking what can make you more marketable, and emphasize that in interviews. Networking, Unix, computer-aided design and manufacturing and windows skills are in great demand.

▶**Do consulting or contract work**. This familiarizes a variety of companies with your work and could turn into a permanent position. Such assignments can also help you figure out whether you like a particular job or company.

▶**Work for free**. It sounds crazy, but volunteering can be a great way to get your talents recognized, and it will help build your skills base. Try groups like the United Way or handicapped training programs.

▶**Contact your alma mater**. Just because you're out of school doesn't mean you should give up on using college career placement services, alumni organizations and directories.

▶**Advertise**. Put an advertisement in the paper or on a bulletin board. Promise a free trial period to prove your worth.

▶**Speak and teach**. Volunteer to speak at an industry association or become a part-time adjunct professor at a local college. These approaches will help publicize you as an expert.

▶**Get printed**. Submit an article for publication in a local user group newsletter. It may catch a local hiring manager's eye.

▶**Network, network, network**. Recruiters say this is still the No. 1 way to get a job. You should not only talk to former co-workers, personal contacts and bosses but also attend trade shows, career fairs and professional association meetings.

Researched and written by Lory Zottola, senior editor, and Cathleen Duffy, a free-lance writer based in Millville, Mass.

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SAUDI CONSOLIDATED ELECTRIC COMPANY in the Eastern Province (SCECO-East) is the largest electric utility company in Saudi Arabia with an installed capacity in excess of 6,100 MW with many large substations, transmission and power plant projects. The following openings are available for qualified individuals with the experience described below.

DP ENVIRONMENT. IBM ES/9021-500, MVS (XA, ESA), JES2, SMP E, VTAM, NCP, HSM, SMS, TSO, ISPF, CICS (V1 7, V2) DB2, COBOL, PL/1, FORTRAN, GENER/OL, EASYTRIEVE PLUS, SAS, GDDM, REXX, ACF2, PANVALET

SYSTEMS PROGRAMMERS (MVS)
Knowledge of system internals and experience in the installation, generation, maintenance, debugging and tuning of operating system software.

SYSTEMS PROGRAMMER (CICS)
Knowledge of CICS internals and externals and experience in the installation, maintenance, debugging and tuning of CICS systems. DB2 and GENER/OL exposure is a plus.

ENGINIEERING APPLIC. SYSTEMS ANALYST
Good command of FORTRAN, GDDM, and JCL. Strong background in PL/1, REXX, Graphics Program Generator, and Project management software is a plus.

DB2 APPLICATIONS PROGRAMMERS/ANALYSTS
Sufficient experience in the development and maintenance of DB2 batch and on-line (CICS) applications. Knowledge of GENER/OL, EASYTRIEVE PLUS and CASE tools is a plus.

DB2 DATABASE ADMINISTRATORS
Working experience in native DB2 environments. Good background in DB2 performance and tuning, controlling DB2 installation parameters, backup and recovery, and logical and physical database design.

DB2 SYSTEMS PROGRAMMERS
Working experience in the installation and maintenance of DB2 subsystems. Good background in DB2/CICS interface is a plus.

ACF2 SECURITY ADMINISTRATORS
Working experience in the implementation of ACF2 under TSO and CICS.

SOFTWARE QUALITY ASSURANCE ANALYSTS
Good background in the development and maintenance of application systems. Working experience in the development, update/revision, and enforcement of DP standards and procedures.

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Data Processing

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- Thorough knowledge of accounting concepts and systems including A/P, A/R, Payroll/Personnel, and G/1.
- Knowledge of retail business systems preferred.
- 1-2 years management experience.
- 5-8 years exp. in the development and maintenance of application systems.
- Understanding of MVS concepts and skills.
- Work exp. with DB2 preferred.
- Strong written and verbal skills.

PACE has an IBM 3090 supported by a highly professional staff. Salary range: $45,000-$55,000 with a competitive benefit package and 401 (k) plan. If you are looking for a chance to grow in a challenging environment, send your resume and salary requirements to:

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Computer Vendor and Consulting	251,253
Computer Manufacturer	109,518
large-scale computers	52,213
medium-scale computers	67,325
small-scale computers	46,945
personal computers	73,925
technical workstations	30,943
Software Vendor	160,264
for large-scale systems	71,152
for medium-scale systems	81,799
for small-scale systems	72,212
for personal computers	66,366
for technical workstations	26,022
Non-CPU Computer Products Manufacturer	34,311
VAR/Dealer/Retailer	44,773
DP Service Bureau/ Contract DP Services	52,375
Consulting/Planning	112,149
Manufacturer (not computers)	229,608
Insurance	62,539
Healthcare	57,788
Banking/Financial Services	123,348
Government Federal/State/Local	107,915
Business Service (except DP)	35,940
Communications Systems	30,264
Public Utilities	43,687
Transportation	49,151
Wholesale/Retail Trade	82,674
Education	91,073

SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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We seek a hands-on Sr. Programmer to provide day-to-day direction to the programming staff. Specific duties include designing and testing applications on a Novell Netware 386 LAN in Advanced Revelation using PICK BASIC and on an IBM RS/6000 running UNIX (AIX) written for Unidata DBMS in PICK BASIC. Requires a Bachelors degree with 5 years programming experience, excellent communications skills, proficiency in project management and a supervisory background. Association and accounting applications experience preferred.

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With 3+ years experience.

IMS support functions including definition, reorganization, maintenance and software installation. DB2 or VSAM tuning experience desirable.

PROGRAMMER/ANALYSTS

With 2+ years experience.

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- Strong FOCUS, CICS, COBOL, VSAM, and OS JCL skills with 2-4 years design, programming and implementation experience required. Human Resources, Payroll, or Workers' Compensation application experience desirable. A plus for this position would be a background in the GENESYS Human Resources & Payroll package.
- Material Control Systems experience, with CICS/IMS/COBOL/VSAM expertise. Must be comfortable in a team environment and have solid communication skills.
- Microfocus COBOL Workbench experience with CICS/DB2/IMS knowledge for a major project linking DB2 and IMS database. (2 positions)
- Production Support Systems experience, with FOCUS/DATACOM/CICS/IMS expertise.
- Strong COBOL/CICS/DATACOM experience. Desired but not required: IDEAL, IMS, FOCUS, and/or DB2; and knowledge of Engineering, Logistics, Configuration Management, or MRP systems.
- Experienced Microfocus Cobol Workbench/SYBASE or Microsoft SQL Server developer for PC LAN development.
- 4GL PC development experience with Advanced Revelation or Revelation G2B.
- PC LAN Network Administrator with experience in NOVELL 3.11 and Windows configurations, preferably NOVELL certified.

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The ideal candidate will have a minimum of 2 years' experience programming in an AS/400-S/38 environment in RPG III or COBOL. A working knowledge of DDM/APPC/APPN is a plus.

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Minimum 3+ years' experience developing and designing application systems on a PC, using Clarion, D Base III, IV, Oracle or C languages. Strong technical skills a plus.

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Minimum 2+ years' experience with VAX VMS systems using COBOL. Knowledge of RMS file structures, Decforms or Datatrieve a plus.

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- 3 years experience as a DBA in DB2 or Ingres
- Case Tools: Bachman, IEF, ADW

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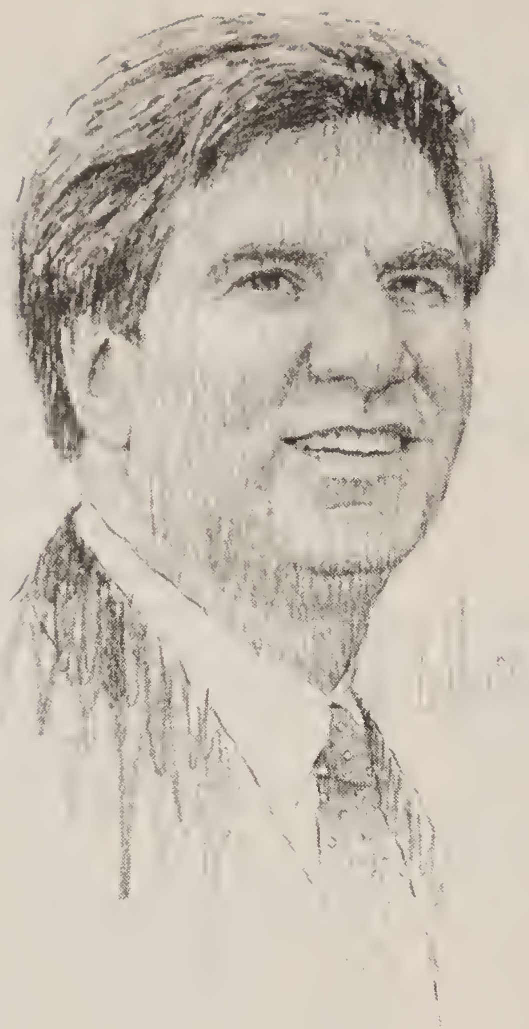

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President
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"In a nutshell, Version Merger accelerates the reconciliation of multiple versions of application systems. Since companies typically purchase off-the-shelf software and then make modifications to fit their own internal requirements, they must also make the necessary upgrades every time a new version is released. With Version Merger, much of that task is accomplished automatically. By identifying and reconciling conflicts between internal customized software and vendor changes in new releases, Version Merger automates all aspects of the upgrading process.

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"To reach project managers within sites responsible for maintaining and upgrading application systems, card deck advertising has really paid off. *Computerworld's Direct Response Cards*, in particular, have helped us achieve widespread success in finding individuals actually plagued by upgrade problems. With its longstanding reputation as the industry's news leader, *Computerworld* delivers a large paid circulation that definitely works to our benefit.

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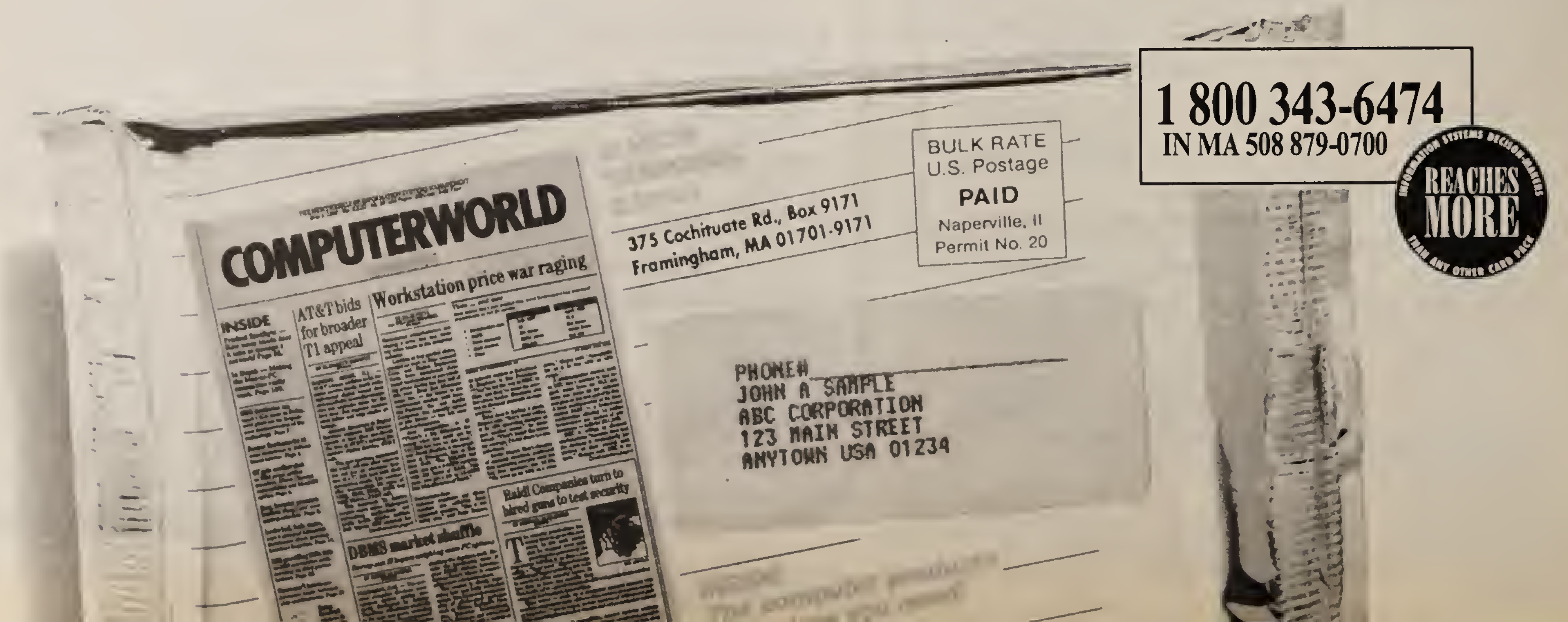

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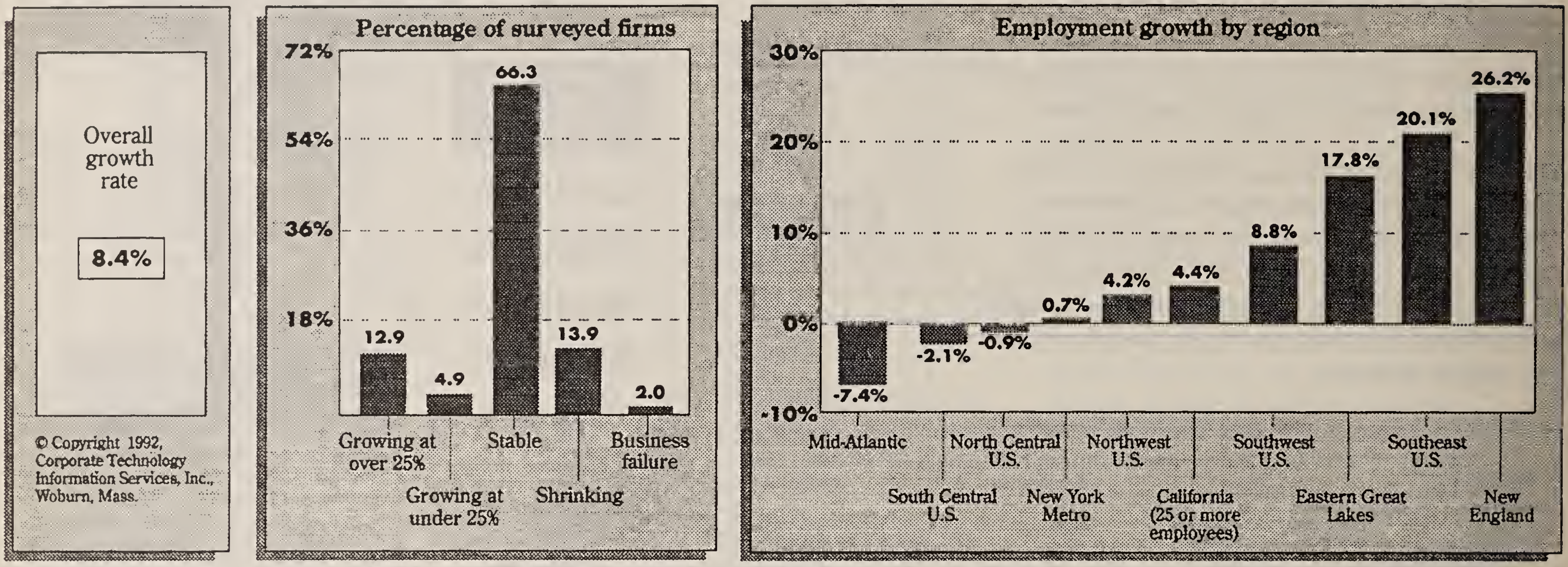

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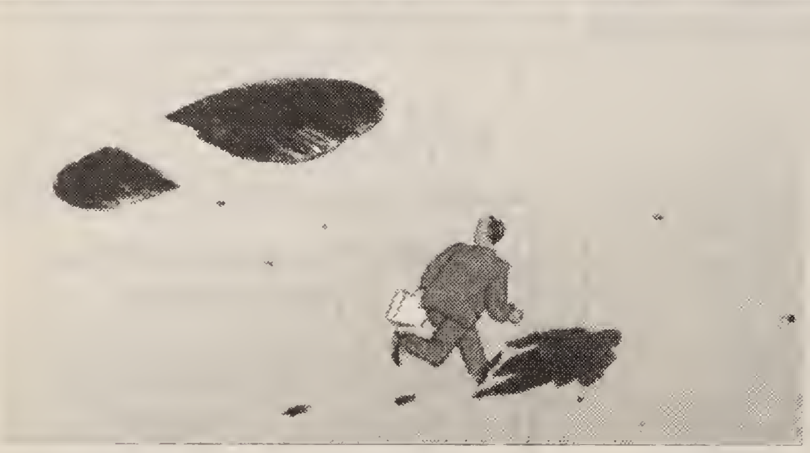

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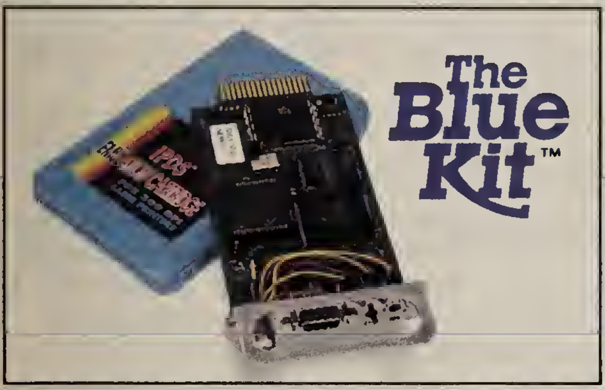

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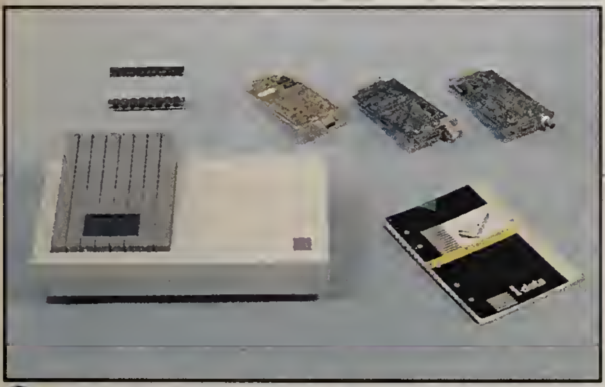

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MARKETPLACE

Few options for virus victims

BY ERIC A. SAVAGE
SPECIAL TO CW

When news emerges about a new computer virus threat, such as the recent Michelangelo scare, one of the first questions that springs to mind — aside from how to avoid damage altogether — is how to get compensation for any damage that might occur. Usually, the answer is that unless you happen to be insured against such an event, you are out of luck.

Redress in court sounds great, but it may not be realistic. The sad truth is that many virus infectors are never caught. Even if you succeed in finding the culprit and obtaining a substantial judgment based on documented calculations, the miscreant will likely have little or no resources to pay the judgment. This can leave you with a sense of outrage, a damaged business and a large legal bill.

There's not much more hope if your system was infected with software bought from a vendor.

Usually, software warranties state that the vendor will repair or replace defective software but will not accept responsibility for other problems.

Unfortunately, the only way to override a warranty is to prove that the vendor was grossly negligent — that the firm knew the software was infected and sold it anyway, for example.

Take precaution

A more likely way to obtain compensation is to act before the fact. There are two ways to do this:

Make sure you have a well-documented self-policing policy against viruses and take out an insurance policy that covers you for any damages incurred.

Virus coverage is available from some insurance companies, but not many users take advantage of it. "Those types of policies are not terribly common," says Mark Hutchins, vice president of underwriting at Media/Professional Insurance, Inc. in Kansas City, Mo. In fact, Hutchins says he cannot recall anyone ever filing any virus-related claims.

The amount of coverage that's desirable depends on the degree to which you feel your company is exposed to outside sources of software contamination and how computer-dependent you are.

Virus insurance should cover not only your physical hardware but the integrity of your software and data as well. Business interruption insurance and necessary arrangements for hot sites and the like are also available.

Even before you apply for insurance, however, take a hard look at your self-policing policies. Nine-tenths of the law is self-protection coupled with common sense. Whether you end up filing a suit or pursuing an insurance settlement, you'll need to prove that you guard your data and computers.

Cover all the bases

A well-designed and maintained self-policing policy makes it harder for an insurer to argue that the company had lax policies that made it easier for contamination to occur and therefore its damages should be reduced accordingly.

A good self-policing policy contains well-defined and publicized rules, complete with explanations of disciplinary measures, that should apply to all employees with computer access. It should include strict procedures regarding the use of disks brought from home, the downloading of programs from bulletin boards and similar practices that might unwittingly introduce a virus.

In addition, subject vendors, outside programmers and maintenance firms to the same rules and make sure that they are acknowledged in writing.

At this point, that's as much as you can do. Most states have enacted statutes criminalizing implantation of viruses, as has the federal government, but these laws provide little realistic protection against viruses.

That leads us back to the very first issue — self-protection. By recognizing the possibility of a virus disaster and protecting against it and the resulting financial damage, companies help themselves in the long run.

Savage practices with the Newark, N.J., and New York City law firm of Hellring, Lindeman, Goldstein & Siegal.

Assessing infection damage

If, despite your best efforts, your system is infected by a virus, you should try to determine the source of contamination. Then you must assess your financial damage, based on the following criteria:

- **Costs of eradicating the virus,** including labor, equipment and the like.
- **Out-of-pocket losses,** including repairs, service, replacement equipment, software and lost labor costs. This also includes hot site fees.
- **Business interruption loss,** including lost sales and lost profits, among others.

Losses can be very hard to gauge. But bear in mind that extreme precision in fixing damages is not necessary. You are only expected to make your best approximations based on available data. If your business comes to a screeching halt for two days, for example, it's not unreasonable to suggest that the company is entitled to the lost profits or net income for those days.

- **The cost of lost data.** This too can be hard to quantify in dollars and cents, and expert assistance may be necessary. However, a company that loses data can certainly make a claim both for damage of the resources that went into the generation and collection of the data and for the cost of replicating it.

If you decide to file suit, be aware that you do not have to pursue your claim for virus damage under a confusing computer law statute.

Legally, virus claims are given the same consideration as claims for intentional interference with private property. In essence, the court would probably view the hacker as if he had physically come into your business and smashed your computers with a crowbar.

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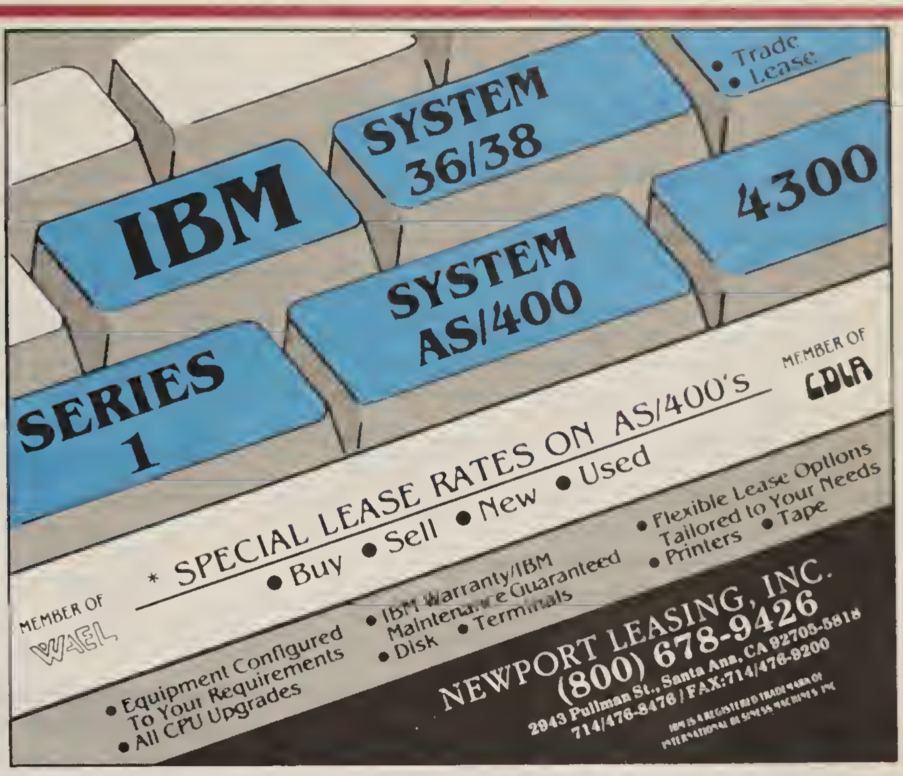

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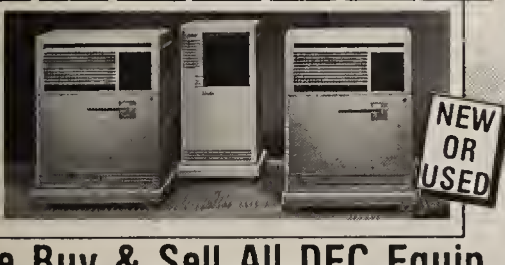

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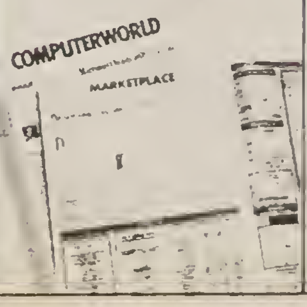

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The BoCoEx index on used computers

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	Closing price	Ask	Bid
IBM XT Model 089	$300	$400	$100
AT Model 099	$400	$525	$150
AT Model 239	$550	$650	$175
AT Model 339	$600	$700	$250
PS/2 Model 30 286	$650	$900	$300
PS/2 Model 60	$700	$900	$325
PS/2 Model 80	$2,050	$2,100	$1,100
PS/2 Model 90	$4,300	$4,600	$3,300
Compaq Portable II	$450	$500	$375
Portable 286	$600	$800	$250
Portable 386	$2,000	$2,125	$1,000
SLT 286	$700	$900	$400
LTE 286	$900	$1,100	$500
Deskpro 286E	$600	$1,000	$325
Deskpro 386/20	$1,800	$2,000	$1,100
Apple Macintosh Plus	$600	$750	$475
SE	$875	$1,050	$650
IIX	$2,800	$3,250	$2,000
IICI	$3,400	$3,600	$2,460
IIFX	$4,300	$4,900	$3,700

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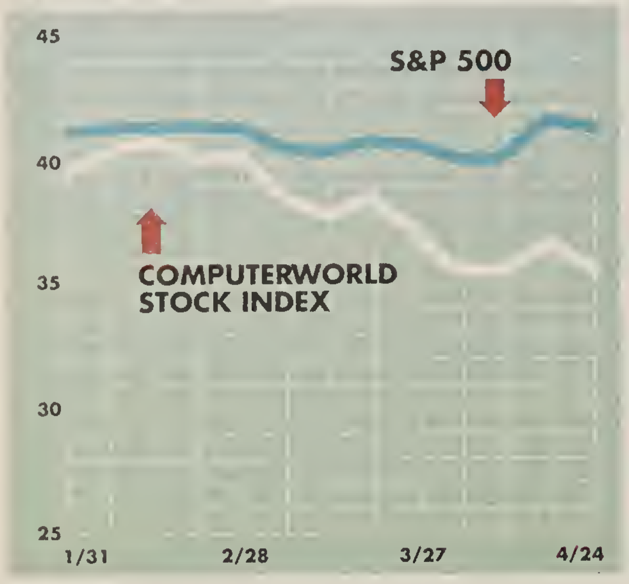

Industry Almanac

RECOMMENDATION CHANGES

DOWNGRADED FROM BUY TO NEUTRAL: **Zeos International Ltd.** (Alex. Brown & Sons, Inc.). A recent visit to the company revealed major changes taking place and the large expenses associated with them. Zeos is in the process of revamping its internal information systems department, building an international sales structure and developing new portable and desktop computers.

Do not expect international revenue or sales from existing notebooks to offset this increase in costs. The rate of change at the company is encouraging, but these activities are unlikely to generate growth until 1993.

Zeos' stock has fallen during the past several weeks. Shares are now trading near their 52-week low (see chart), and earnings per share estimates have been lowered. Last year's earnings per share were $1.31; this year's are slated to be 85 cents.

KIM S. NASH

Scraping bottom

A sampling of stocks trading near their 52-week low

	Closing price April 16	Percent from 52-week low	Percent from 52-week high
Adobe Systems, Inc. Mountain View, Calif.	$41.75	6%	39%
Advanced Logic Research, Inc. Irvine, Calif.	$6.50	4%	64%
Bachman Information Systems, Inc. Burlington, Mass.	$13.50	2%	64%
Bell Atlantic Corp. Princeton, N.J.	$42.63	6%	64%
Comdisco, Inc. Foster City, Calif.	$13.50	4%	50%
Digital Equipment Corp. Maynard, Mass.	$46.25	5%	37%
QMS, Inc. Mobile, Ala.	$10.00	3%	63%
US West Denver, Colo.	$34.63	5%	11%
Zeos International, Inc. St. Paul, Minn.	$11.75	12%	54%

CW Chart: Michael Siggins

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, APRIL 24, 1992

TOP PERCENT GAINERS

Gandalf Technologies Inc.	17.65
Digital Systems Int'l Inc.	13.95
Maxtor Corp.*	12.90
Ask Computer Systems	11.21
Sprint Corp. (L)	10.86
American Mgmt. Systems*	10.71
Interleaf Inc.	10.34
Western Digital Corp.	10.00

TOP PERCENT LOSERS

Network Systems Corp.	-29.36
Mips Computer Systems	-28.09
Software Publishing Corp.	-24.67
Storage Technology*	-23.08
Wang Labs Inc. (b)*	-21.95
Zeos International Ltd.	-19.15
Cray Computer	-18.42
General Datacomm Inds.	-18.42

TOP DOLLAR GAINERS

Matsushita Electronics	4.50
Stratus Computer Inc.*	2.88
Bellsouth Corp.	2.75
Sprint Corp. (L)	2.38
American Mgmt. Systems*	2.25
Informix Corp.	2.13
American Info Techs Corp.*	1.63
Digital Systems Int'l Inc.	1.50

TOP DOLLAR LOSERS

Microsoft Corp.*	-15.38
Storage Technology*	-13.88
Exabyte	-5.63
Cray Research Inc.*	-5.50
Novell Inc.*	-5.50
BMC Software Inc.	-5.50
Progress Software Corp.	-5.25
Northern Telecom Ltd.*	-5.00

Communications and Network Services Off 4.47%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
OTC	15.00	6.75	3 COM Corp.*	10.88	0.00	0.00
NYS	66.00	55.75	American Info Techs Corp.*	62.38	1.63	2.67
NYS	43.25	32.88	AT&T* (H)	43.25	0.25	0.58
OTC	4.25	1.25	Artel Communication Corp.	1.38	-0.25	-15.38
NYS	50.63	40.25	Bell Atlantic Corp.	43.88	1.25	2.93
NYS	53.00	43.38	Bellsouth Corp.	48.38	2.75	6.03
NYS	9.38	4.75	Bolt, Beranek & Newman	5.13	-0.75	-12.77
NYS	65.88	30.25	Cabletron Systems	52.25	-3.00	-5.43
OTC	31.00	11.75	Chipcom Corp.	23.50	-2.13	-8.29
OTC	43.63	13.88	Cisco Systems Inc.	36.50	-2.13	-5.50
OTC	35.25	13.75	Compression Labs Inc.	19.25	-2.75	-12.50
OTC	4.63	1.50	Data Switch Corp.	1.75	-0.25	-12.50
NYS	23.63	12.38	Digital Comm. Assoc.*	18.63	-1.13	-5.70
OTC	19.25	8.50	Digital Systems Int'l Inc.	12.25	1.50	13.95
OTC	9.75	3.63	DSC Communications	4.25	-0.88	-17.07
OTC	10.88	5.00	Fibronix Int'l Inc.	6.25	-0.13	-1.96
OTC	37.50	13.50	Filenet Corp.	23.63	-1.13	-4.55
OTC	3.75	1.13	Gandalf Technologies Inc.	2.50	0.38	17.65
OTC	2.69	1.19	Gateway Communications	1.50	-0.13	-7.69
NYS	5.50	2.13	General Datacomm Inds.	3.88	-0.88	-18.42
ASE	5.88	0.50	Go Video	3.00	-0.13	-4.00
NYS	35.00	28.13	GTE Corp.*	32.25	0.38	1.18
NYS	70.63	50.00	ITT Corp.	63.50	-2.00	-3.05
OTC	36.13	25.25	MCI Commmunications Corp.	33.50	0.38	1.13
OTC	14.50	5.00	Microcom Inc.	9.50	-0.75	-7.32
NYS	18.25	7.00	Network Equipment Tech.*	13.63	-0.38	-2.68
OTC	25.50	6.75	Network General	16.50	-2.00	-10.81
OTC	20.00	9.63	Network Systems Corp.	9.63	-4.00	-29.36
OTC	17.88	5.50	Newbridge Networks Corp.	16.13	-0.88	-5.15
NYS	49.25	32.50	Northern Telecom Ltd.*	43.00	-5.00	-10.42
OTC	65.00	22.63	Novell Inc.*	52.75	-5.50	-9.44
NYS	82.38	68.00	Nynex Corp.*	75.38	0.63	0.84
OTC	37.50	16.50	Octel Communications Corp.	23.25	-2.25	-8.82
OTC	11.13	5.63	Penril Data Comm. Ntwks.	6.50	-0.38	-5.45
OTC	53.00	19.75	Picturetel Corp.	35.50	-2.00	-5.33
OTC	18.75	9.75	Proteon Inc.	11.75	-1.00	-7.84
NYS	19.75	11.63	Scientific Atlanta Inc.	16.00	-0.25	-1.54
NYS	66.00	49.00	Southwestern Bell Corp.	62.63	1.13	1.83
NYS	31.50	20.75	Sprint Corp. (L)	24.25	2.38	10.86
OTC	46.25	14.25	Synoptics Communications	20.00	-3.63	-15.34
NYS	38.88	32.88	US West Inc.	35.63	1.00	2.89
OTC	41.25	21.25	Wellfleet Communications	36.75	1.50	4.26

PC / Workstations Off 7.11%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
OTC	18.00	6.25	Advanced Logic Research	6.25	-0.25	-3.85
OTC	70.00	40.25	Apple Computer Inc.*	56.50	-2.50	-4.24
OTC	32.25	14.50	AST Research Inc.*	16.25	-1.00	-5.80
NYS	20.00	10.13	Commodore Int'l	13.50	-0.25	-1.82
NYS	61.88	22.13	Compaq Computer Corp.*	27.00	1.00	3.85
OTC	28.63	13.50	Dell Computer Corp. (H)	26.00	-2.13	-7.56
OTC	7.75	3.00	Everex Systems Inc.	6.63	-0.13	-1.85
NYS	34.00	21.25	Harris Corp.	28.50	-0.88	-2.98
NYS	85.00	44.63	Hewlett Packard Co.*	78.50	-3.25	-3.98
OTC	19.13	7.88	Mips Computer Systems	8.00	-3.13	-28.09
NYS	29.75	13.25	Silicon Graphics	16.38	-2.38	-12.67
OTC	38.63	20.75	Sun Microsystems Inc.*	27.00	-1.50	-5.26
NYS	35.63	23.38	Tandy Corp.*	28.88	-0.38	-1.28
NYS	11.13	5.13	Zenith Electronics	7.38	-1.00	-11.94
OTC	25.50	9.50	Zeos International Ltd.	9.50	-2.25	-19.15

Large Systems Off 3.16%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
ASE	20.63	11.63	Amdahl Corp.*	16.50	1.38	9.09
NYS	13.38	7.50	Control Data Corp.	11.63	0.13	1.09
NYS	19.25	8.88	Convex Computer	10.25	-0.38	-3.53
OTC	19.63	3.75	Cray Computer	3.88	-0.88	-18.42
NYS	52.25	31.50	Cray Research Inc.*	35.50	-5.50	-13.41
NYS	22.50	8.00	Data General Corp.	8.88	-0.38	-4.05
NYS	73.50	44.00	Digital Equipment Corp.*	45.88	-0.38	-0.81
NYS	109.38	81.63	IBM*	88.13	-0.50	-0.56
NYS	128.25	93.50	Matsushita Electronics	104.00	4.50	4.52
OTC	27.00	10.75	Pyramid Technology	12.00	-0.63	-4.95
OTC	18.50	7.50	Sequent Computer Sys.	11.88	-0.38	-3.06
OTC	18.38	10.13	Sequoia Systems Inc.	14.25	-0.13	-0.87
NYS	54.25	27.25	Stratus Computer Inc.*	47.50	2.88	6.44
NYS	17.63	9.50	Tandem Computers Inc.*	12.63	-0.25	-1.94
OTC	4.50	1.19	Tandon Corp.	1.19	-0.06	-4.96
NYS	11.75	3.25	Unisys Corp.*	10.50	0.38	3.70
ASE	7.50	2.00	Wang Labs Inc. (b)*	4.00	-1.13	-21.95

Software & DP Services Off 4.32%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
OTC	68.50	39.25	Adobe Systems Inc.	39.75	-2.00	-4.79
OTC	13.25	3.50	AI Corp.	8.13	-0.38	-4.41
OTC	54.50	20.88	Aldus Corp.	20.88	-1.25	-5.65
OTC	19.75	10.13	American Software Inc.	15.63	-0.50	-3.10
OTC	20.00	7.50	Ask Computer Systems	14.88	1.50	11.21
OTC	62.25	23.25	Autodesk Inc.	29.75	-4.00	-11.85
OTC	37.75	13.25	Bachman Info. Systems	13.75	0.25	1.85
OTC	42.50	25.88	BGS Systems Inc.	36.25	0.25	0.69
OTC	79.00	33.00	BMC Software Inc.	57.50	-5.50	-8.73
OTC	20.50	8.75	Boole & Babbage (H)	18.00	-1.63	-8.28
OTC	86.75	39.50	Borland Int'l Inc.*	48.75	-3.88	-7.36
OTC	11.25	4 75	CE Software	5.25	-0.88	-14.29
ASE	13.75	6.50	Cheyenne Software Inc.	11.88	0.50	4.40
OTC	20.38	7.50	Cognos Inc.	8.25	0.13	1.54
NYS	17.00	7.25	Computer Associates*	14 63	-0.25	-1.68
OTC	21.50	12.00	Comshare Inc.	15.38	-0.13	-0.81
OTC	47.88	15.00	Easel Corp.	28.00	-1.50	-5.08
OTC	19.50	9.25	Goal Systems Int'l	16.00	-1.88	-10.49
OTC	25.50	11.50	Group I Software	15.75	-1.25	-7.35
OTC	7.00	4.50	Hogan Systems Inc.	4 88	0.25	5.41
OTC	36.25	17.75	Information Resources	22.75	0.63	2.82
OTC	33.00	5.25	Informix Corp.	30.88	2.13	7.39
OTC	3.63	1.06	Intellicorp Inc.	1.63	-0.13	-7.14
OTC	30.50	16.25	Intergraph Corp.	17.25	0.25	1.47
OTC	15.00	4.88	Interleaf Inc.	12.00	1.13	10.34
OTC	20.25	7.38	Intersolv Inc.	16.38	-0.38	-2.24
OTC	39.75	10.50	Knowledgeware Inc.	14.50	-1.50	-9.38
OTC	45.25	20.25	Legent Corp.*	31.50	-3.50	-10.00
OTC	40.75	18.00	Lotus Development*	31.50	-1.50	-4.55
OTC	7.38	2.38	Meca Software	3.75	-0.25	-6.25
OTC	22.25	11.50	Mentor Graphics	14.38	0.13	0.88
OTC	20.16	6.50	Micrografx Inc.	18.25	-0.25	-1.35
OTC	133.25	60.50	Microsoft Corp.*	112.25	-15.38	-12.05
OTC	21.13	7.00	Oracle Corp.*	13.13	-1.00	-7.08
OTC	37.50	11.50	Parametric Technology (H)	35.75	1.00	2.88
OTC	11.00	5.88	Phoenix Technologies	9.50	0.38	4.11
OTC	25.25	9.38	Platinum Technology	15.00	-0.25	-1.64
OTC	46.50	27.50	Progress Software Corp.	33.75	-5.25	-13.46
OTC	26.63	11.50	Quarterdeck Office Sys.	13.75	-2.00	-12.70
OTC	29.50	10.00	Rasterops	16.25	-3.00	-15.58
OTC	17.25	6.75	Ross Systems	8.75	-1.25	-12.50
OTC	26.25	12.50	Software Publishing Corp.	14.13	-4.63	-24.67
OTC	8.50	2.00	Software Toolworks Inc.	6.00	-0.13	-2.04
OTC	7.25	1.75	Spinnaker Software	3.75	-0.13	-3.23
OTC	16.50	6.25	State of the Art	11.00	-1.75	-13.73
NYS	25.25	10.88	Sterling Software Inc.	18.25	-0.25	-1.35
OTC	30.00	14.25	Struct. Dynamics Research	16.25	0.00	0.00
OTC	31.75	15.00	Sybase Inc.	28.75	0.00	0.00
OTC	51.00	19.50	Symantec Corp.	41.75	-2.50	-5.65
NYS	15.50	7.25	Systems Center Inc.*	11.25	0.25	2.27
OTC	31.00	8.34	System Software Assoc.	25.50	-2.63	-9.33
OTC	6.63	2.75	Wordstar	2.75	-0.38	-12.00

Semiconductors Off 3.55%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
NYS	21.50	8.38	Advanced Micro Devices	15.00	-1.75	-10.45
NYS	12.50	7.00	Analog Devices Inc.	9.63	-0.38	-3.75
OTC	18.88	6.75	Atmel Corp.	8.88	-0.13	-1.39
OTC	14.13	7.00	Chips and Technologies	8.13	0.25	3.17
NYS	24.50	10.13	Cypress Semiconductor Corp	10.13	0.00	0.00
NYS	11.63	6.25	Dallas Semiconductor	7.75	-0.88	-10.14
OTC	68.75	38.50	Intel Corp.*	51.75	-0.50	-0.96
NYS	11.88	6.50	LSI Logic Corp.	6.50	-0.50	-7.14
NYS	22.38	10.88	Micron Technology	13.63	-1.00	-6.84
NYS	82.50	54.00	Motorola Inc.*	79.13	-2.63	-3.21
NYS	11.50	3.88	National Semiconductor*	8.75	-1.13	-11.39
OTC	27.00	13.00	Sierra Semiconductor	16.50	-1.50	-8.33
NYS	43.25	26.00	Texas Instruments*	34.75	-1.50	-4.14
OTC	11.63	5.88	VLSI Technology	7.63	0.50	7.02
OTC	15.75	3.75	Weitek	4.50	0.00	0.00
ASE	6.25	2.00	Western Digital Corp.	4.13	0.38	10.00
OTC	32.50	19.25	Xilinx	25.25	-1.25	-4.72
OTC	11.50	4.25	Zilog Inc.	7.63	-1.00	-11.59

Peripherals and Subsystems Off 4.13%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
OTC	2.69	1.00	Apertus Technologies	1.63	-0.06	-3.73
OTC	10.00	2.75	Archive Corp.	8.88	-0.50	-5.33
OTC	24.00	11.25	Banctec Inc.	22.25	0.25	1.14
OTC	23.50	4.88	Cambex Corp.	13.13	-2.63	-16.67
ASE	13.88	7.00	Cognitronics Corp. (H)	13.50	-0.38	-2.70
NYS	28.13	12.50	Conner Peripherals*	18.38	-1.63	-8.13
ASE	19.66	3.22	Dataram Corp.	12.50	-2.50	-16.67
NYS	16.88	4.88	EMC Corp.	12.50	-0.75	-5.66
OTC	9.75	4.75	Emulex Corp.	7.75	-0.25	-3.13
OTC	23.00	14.75	Evans & Sutherland	17.00	0.75	4.62
OTC	40.63	13.38	Exabyte	32.13	-5.63	-14.90
OTC	27.25	14.75	Intelligent Info. Systems	24.50	-0.25	-1.01
OTC	11.25	4.00	Iomega Corp.	7.88	0.38	5.00
OTC	34.75	14.50	IPL Systems Inc.	22.25	-4.50	-16.82
OTC	24.50	11.75	Komag Inc.	14.75	0.75	5.36
OTC	13.13	1.63	Maxtor Corp.*	13.13	1.50	12.90
OTC	15.88	5.50	Micropolis Corp.	10.00	-1.00	-9.09
NYS	98.75	83.50	3M Co.	92.63	-0.13	-0.13
OTC	9.25	3.50	Printronix Inc.	6.00	0.25	4.35
NYS	26.75	9.75	QMS Inc.	10.00	0.00	0.00
OTC	18.00	8.88	Quantum Corp.	15.25	-0.25	-1.61
OTC	12.25	5.00	Radius Inc.	9.50	-1.50	-13.64
NYS	12.88	5.88	Recognition Equipment	9.50	-0.75	-7.32
OTC	12.50	5.38	Rexon Inc.	10.50	0.00	0.00
OTC	16.50	7.13	Seagate Technology*	14.75	0.50	3.51
NYS	78.00	34.75	Storage Technology*	46.25	-13.88	-23.08
NYS	30.88	16.00	Tektronix Inc.	18.38	-0.75	-3.92
NYS	82.25	51.50	Xerox Corp.	77.88	0.88	1.14

Services Off 3.82%

Exch	52-Week	Range		April 24 Close	Wk Net Change	Wk Pct Change
OTC	28.25	16.25	American Mgmt. Systems*	23.25	2.25	10.71
NYS	5.38	2.88	Anacomp Inc.	4.38	-0.13	-2.78
OTC	19.00	12.00	Analysts Int'l	17.75	0.50	2.90
NYS	49.00	29.50	Auto Data Processing*	45.63	-0.88	-1.88
NYS	26.78	13.00	Comdisco Inc.*	13.13	-0.38	-2.78
OTC	13.50	7.75	Computer Horizons	12.00	-0.25	-2.04
NYS	84.88	52.25	Computer Sciences*	69.13	-1.38	-1.95
NYS	10.38	7.00	Computer Task Group	9.38	0.00	0.00
OTC	19.25	7.75	Corporate Software	13.50	-0.75	-5.26
OTC	30.75	12.75	Egghead Discount Software	21.50	-3.00	-12.24
NYS	33.06	22.75	General Motors E (EDS)*	27.88	-1.75	-5.91
OTC	30.38	8.88	Intelligent Electronics	11.25	-2.13	-15.89
OTC	14.88	2.25	Merisel	11.13	-1.38	-11.00
OTC	15.75	5.75	Microage Inc.	11.25	-1.13	-9.09
OTC	41.25	19.50	Paychex	36.00	-2.25	-5.88
NYS	73.00	43.25	Policy Management Sys.	64.75	-4 50	-6.50
NYS	41.38	19.38	Reynolds and Reynolds	40.50	-0.13	-0.31
OTC	32.00	21.25	SEI Corp.	26.75	-0.75	-2.73
OTC	24.38	17.00	Shared Medical Systems	18.88	-0.25	-1.31
OTC	24.88	13.50	Sungard Data Systems (H)	23.00	0.00	0.00
NYS	6.13	1 13	Ultimate Corp.	1.88	-0.13	-6.25

Note: United Telecom changed its name to Sprint Corp.

KEY: (H) = New annual high reached in period (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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COMPUTER INDUSTRY

IN BRIEF

Q1 better for most

Sun Microsystems, Inc. reported fiscal third-quarter profits of $61.4 million, up 5% from the same period a year earlier. Revenue grew 12% to $952 million from the comparable quarter last year. . . . **Unisys Corp.** reported its second straight period in the black, posting a first-quarter profit of $48.3 million — compared with a $98.2 million loss for last year's quarter. . . . **Data General Corp.** revealed a $55.3 million loss for its fiscal second quarter, which includes a $48 million restructuring charge. Revenue was off 17% from the year-earlier period at $273.8 million. . . . **Amdahl Corp.**'s first-quarter earnings declined 63% to $4.3 million on revenue of $497 million, an 11% increase from the year-earlier period. . . . **Legent Corp.**'s fiscal second-quarter operating earnings soared 67% to $15.4 million. The costs of acquiring Spectrum Concepts cut net profits to $11.8 million. Revenue for the period grew 28% to $66 million. . . . **Stratus Computer, Inc.** posted first-quarter earnings of $11.4 million, up 47% from the same period last year. Revenue for the period was $101 million, a 9% increase from 1991's first quarter. . . . Meanwhile, Stratus' archrival **Tandem Computers, Inc.** reported fiscal second-quarter profits of $8.8 million compared with earnings of $18 million for the comparable period last year. Revenue for the quarter climbed 2% to $502.9 million. . . . **Informix Corp.** posted first-quarter earnings of $11.4 million on revenue of $59 million — a 56% increase from the previous year. . . . **The Ask Cos.** earned $5.1 million for the third fiscal quarter compared with a $2.3 million loss for the same period last year. Revenue was $112.1 million, up 29% from last year.

Toshiba tinkers with portables' strategy

BY MICHAEL FITZGERALD
CW STAFF

IRVINE, Calif. — Under fire as unprecedented competition and internal dissension have cost it market share, portable computer pioneer Toshiba America Information Systems, Inc. is fighting back with new, lower-cost machines and a harder edged approach to managing its business.

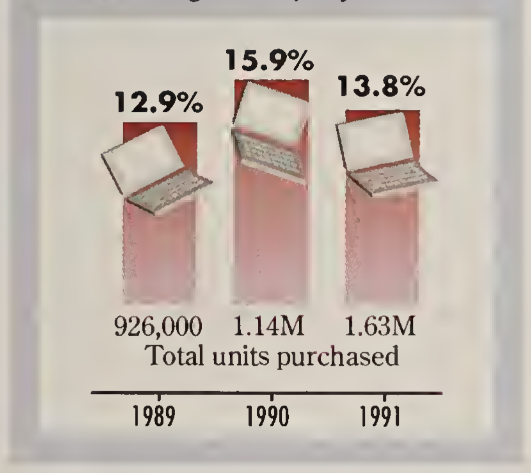
The changes have come in response to a revolution in the portable personal computer business that has seen the market shift from the domain of just a few companies to a hot growth area of which every vendor wants a piece. Competitors began pouring into the market during 1991, as notebook sales began to rocket.

During the period from 1990 to 1991, Toshiba's market share slipped when it was slow to introduce notebooks and match competitors' pricing, observers said. Making matters worse, U.S. management found itself engaged in persistent conflicts with corporate headquarters in Japan, which crippled decision-making.

There has been a noticeable change at Toshiba since last October, when former Xerox Corp. executive Michael Winkler joined the company as vice president and general manager of the U.S. Computer Systems Division.

Up and down

Toshiba's U.S. portable computer market share through retailers has bounced around during the last few years



Source: Computer Intelligence/Infocorp
CW Chart: Janell Genovese

Winkler said he came in well aware of the challenges facing the unit, which shipped about $400 million worth of portables in the U.S. last year.

"I knew there were questions about our ability to hold technological leadership and about communications between Toshiba U.S. and Toshiba Japan, and I think the last six months have dispelled both of those," Winkler said.

Winkler has benefited in part from the introduction of new systems that were being developed when he joined the company. These include a broad line of notebooks, high-end AC-powered portables and the recent introduction of an active-matrix color notebook that coaxes three hours of battery life from an I486SX processor.

Winkler also revamped the company's production methods after being on the job for barely three months. Toshiba said it hopes to boost profits through quicker inventory turnover, tied to just-in-time shipping and manufacturing practices.

Winkler has also pushed the once-taboo topic of second-sourcing in order to compete more effectively on price. While Toshiba's manufacturing arm has figured out how to cut costs, second-sourcing on the low end is likely to occur if the firm is going to play as broadly in the market as Winkler wants.

A needed move

These tactics may prove essential because Toshiba has discovered that a technological edge is not always enough. Pricing in the portable market has fallen dramatically, forcing Toshiba — which traditionally operated as a premium-price vendor — to respond.

"I don't think we forecast the price erosion in the market," Winkler acknowledged. A stung Toshiba has since moved aggressively to cut prices on products and is readying a new line of low-cost notebooks [CW, April 6].

Winkler also restructured the computer systems business. When Toshiba cut some 8% of its work force in February — its fourth round of layoffs since the beginning of 1991 — a significant portion of cuts came from the Computer Systems Division.

Analysts are convinced that Toshiba's corrective actions will work.

Proposals could curtail use of executive stock options

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — In response to the public outcry over senior executives who rake in the green while their companies are awash in red, Congress and the U.S. Securities and Exchange Commission (SEC) are examining proposals that could curtail the use of executive stock options.

Computer companies, which have traditionally relied on the options as a cash-free way to attract talented people to risky new ventures, could be badly hurt by some of the proposed curbs, critics said.

Under current law and accounting practice, no expense is recognized when options are granted, which is one reason why these options are popular with companies.

But that does not sit well with critics who see stock options as "stealth compensation." At a recent hearing, Sen. Carl Levin (D-Mich.), said, "This practice is misleading to potential investors, dilutes the value of stock held by current stockholders, shortchanges the company by foregoing capital, jeopardizes employee morale [and] . . . encourages compensation excess."

Levin has introduced legislation that would require companies to include the "present value" of stock options as an expense in the period that they are granted.

"The negative impact of this proposal would fall disproportionately on America's high-technology industries," said George Sollman, president of Centigram Communications Corp., a San Jose, Calif.-based maker of voice processing gear. Sollman cited a 1986 analysis by Coopers & Lybrand that showed that between 1982 and 1985, a sample of 12 electronics companies would have seen a 44% drop in reported earnings under the proposed changes.

That kind of earnings devastation would cause companies to curtail or abandon the use of options — thereby removing their most effective tool for recruiting top people to risky ventures, Sollman said. "The initial employees at Centigram came from established companies like IBM, Xerox and Rolm. Without stock options, we could not have attracted those key people."

Last week, Sollman said, Levin and fellow Michigan lawmaker John D. Dingell (D), in response to union outrage at huge awards by Detroit automakers, are determined to make it more difficult for companies to grant stock options.

Sollman said the bill will probably not pass this year but that Levin will look for a way to attach it as a rider to some other more popular legislation.

Scammers get jail time

BY NELL MARGOLIS
CW STAFF

ST. PAUL, Minn. — Two computer service firm executives and a technician convicted of scamming IBM out of some $41.7 million will be doing time instead of time sheets for the next two years, according to a sentence handed down in federal court here last week.

U.S. District Judge Robert Renner fined David Heinen, Data Hardware, Inc.'s founder and president, $250,000 and dispatched him to prison for 30 months without parole for his part in a fraudulent label-switching scheme after a monthlong jury trial last December. Vice President Robert Nelson, also convicted in December, drew a two-year sentence. Computer technician Jeffrey Heinen is on his way to jail for 18 months.

Data Hardware dealt in IBM-manufactured thermonuclear modules (TCM) — the components that house the circuit boards that determine a computer's capability.

IBM launched an exchange program under which worn TCMs — which sold at prices ranging from $50,000 to $140,000 — could be exchanged and replaced by like-kind models in mint condition for a nominal $17,000 fee.

Using Data Hardware as a cover, the court said, Nelson and the Heinens stripped identification labels from low price TCMs and swapped them with ID tags from pricier models. They then "exchanged" the bogus TCMs under the IBM program, sold the components and pocketed the difference.

wysiwyg

HACKER JARGON

angry fruit salad n. A bad visual interface design that uses too many colors. This derives from the bizarre Day-Glo colors found in canned fruit salad.

bogosity n. 1. The degree to which something is bogus. Bogosity is often measured with a bogometer; typical use: when a speaker says something bogus, a listener might raise his hand and say, "My bogometer just triggered ."

essentials n. Things necessary to maintain a productive and secure hacking environment. "A jug of wine, a loaf of bread, a 20-megahertz 80386 box with 8 meg of core and a 300-megabyte disk supporting full Unix with source and X Windows and EMACS and UUCP via a 'blazer to a friendly Internet site, and thou."

lobotomy n. 1. What a hacker subjected to formal management training is said to have undergone.

ALPHABET SOUP

There are 75 acronyms in the following puzzle. Can you find them all?

R	T	S	E	C	M	A	M	I	B	S	R	B	O	C
D	S	C	G	P	H	S	P	R	M	D	A	F	S	L
U	U	C	P	I	L	N	T	T	F	C	C	I	T	T
A	S	M	D	S	S	M	P	W	D	O	C	L	N	P
N	C	A	P	P	M	D	O	B	B	E	R	I	S	N
F	P	T	I	T	P	A	N	S	I	F	T	A	M	P
S	T	F	A	C	S	E	P	D	S	A	D	P	T	I
N	E	U	D	I	N	T	F	N	D	L	N	L	O	M
A	D	D	M	D	A	M	D	S	N	O	C	I	I	S
P	R	P	D	L	I	T	A	C	M	S	E	G	F	C
I	G	P	C	N	E	C	U	S	S	I	A	R	I	S
C	D	U	A	T	R	P	M	G	O	S	I	P	N	D

If you're not having much luck and want a list of the acronyms to look for, please contact Lory Zottola or Jodie Naze at (800) 343-6474.

Dell-icious

Dell has a new logo, featuring the 'E' in its name tilted on its back corner. Glenn Henry, senior VP of product development, says it's supposed to represent a more playful Dell, but one that still means business. Perhaps that also explains the cryptic sentence buried in the legal jargon on the back of the latest Dell catalog. Right after the warning "All prices and specifications are subject to change without notice" appears "No anchovies unless otherwise specified."

TECH TRIVIA

1. What does Bitnet stand for?
2. There are mainly two layouts for a computer keyboard, QWERTY and Dvorak. What two letters appear in the same position on both?
3. The word "Sun" in the company name Sun Microsystems is an acronym. What do the letters S-U-N stand for?

1. Because It's Time Network
2. A and M
3. Stanford University Network

STEAMED

Most shameless exploitation of a dead author's name:
Mark Twain Manufacturing, Inc. in La Grange, Mo., maker of a business computer

Sources: *The New Hacker's Dictionary*, edited by Eric Raymond, The MIT Press; "The Smith & Shows Letter." Trivia is courtesy of the Computer Museum, Boston, whose annual trivia event, the Computer Bowl, will be held on May 1.

WYSIWYG design: Tom Monahan

INSIDE LINES

Scribbling database

▶ Oracle will jump feet first into the pen computing market today when it announces Oracle Card for Pen Computing, a graphical client/server application development tool for use with Microsoft's Windows for Pen Computing environment. Sources indicated that prices will be about $699 for a developer's version and $299 for a runtime, single-license version. It will ship in the fourth quarter. The Redwood Shores, Calif.-based firm said it will announce today a similar development environment, Oracle Card for Windows Version 1.1.

No Fig Newton

▶ Apple is preparing to introduce a pen-controlled handheld computer, code-named Newton, at the Consumer Electronics Show in Chicago on May 29. Users will enter information by simply writing it on the screen. Newton will also be able to exchange information with desktop computers up to six feet away though a wireless connection using infrared light. The product will be about the shape of a videocassette but only half as thick and will sell for less than $700, sources said. Availability is expected by the end of the year.

The patter of little keyboards

▶ "Go-anywhere" companion PCs will start to trickle out in May and June, although their onslaught won't hit until the fall. Apple's PDA machine will be shown at Consumer Electronics, and a couple of vendors, Dell among them, are expected to display their own small portables at PC Expo in June. Phoenix Technologies and Lotus are hard at work convincing hardware makers to use a jointly developed software kit.

Orient express

▶ Rumors abound that Compaq will go offshore for its coming line of low-cost notebooks. Citizen, a Japanese manufacturer, is said to be building all three notebooks to Compaq's specifications. Pricing on the machines, expected in May or June, will start at $999, according to one source. Citizen and Compaq have a long-standing technology relationship.

Frame relay, non — cell relay, oui

▶ A France Telecom spokesman last week coolly disclosed that the company plans to skip over frame relay to become the first European provider of asynchronous transfer mode, or cell-relay networking services, sometime next year. In the meantime, lest users grow restless, France Telecom plans to upgrade its packet-switched network service first to 256K, then to 2M bit/sec., the spokesman said.

Viral mind games

▶ Word spread through academia last week of a new Macintosh virus that, under certain circumstances, can destroy the System 7.0 operating system and other system files. The virus, called Code 252, can cause system crashes and boot failures, according to Gene Spafford, an assistant professor at Purdue University in West Lafayette, Ind. Researchers reported limited sitings and said they do not believe the virus is widespread, but they advised users to install updated seek-and-destroy programs when vendors make them available. One source said the current version of Gatekeeper can detect Code 252.

On-line appeals

▶ Indicating just how pervasive information technology has become, 10 federal appellate court judges in several Western states used E-mail last week to convey their multiple stays for convicted killer Robert Alton Harris. The messaging went on until their system failed, as did all attempts to stay the execution.

Do a good deed department: Last week, thieves stole more than $100,000 worth of computer equipment from Cast, Inc., a Peabody, Mass.-based nonprofit organization that uses computers to help disabled children. None of the equipment has been recovered. Cast needs donations of money or up-to-date computer equipment to get its program back on track. If you can help, contact the organization at (508) 531-8555, or message Cast on AppleLink. Got any news tips? Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474; (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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